

AN INVESTIGATION INTO THE FOOD CHOICES AND THE
PEER INFLUENCE ON FOOD CHOICE OF A GROUP OF
YEAR 5 TO YEAR 8 STUDENTS IN SCHOOLS

A thesis submitted in partial fulfilment of the requirements for the Degree

of Master of Science

in Child and Family Psychology

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2015

ABSTRACT

Understanding children's food choices plays an important part in finding a solution to the increasing rates of childhood obesity. In this study, 109 students from primary schools in New Zealand completed a simulated lunch-box food choice survey individually and then in small groups. Their choices and reasons given for the choices were analysed using a rank-order analysis. Fruit and vegetables were included more and health rated as more important than found in previous studies of children the same age. Across the two surveys, students choices were largely similar. Small differences were found in the amount of vegetables, junk foods and sweet snacks included by older and younger students and between the individual and group surveys. A stop-motion animation task was included as an enjoyable and educational activity to support the completion of the group survey.

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Table of Terms

| Term | Description |
|-----------|---|
| Biscuit | biscuit /'bɪskət/ noun 1. <u>a small unleavened cake, usu. flat and crisp and often sweet.</u> 2. fired unglazed pottery. 3. a light brown colour. |
| Chippies | chip ¹ /tʃɪp/ noun 1. a small piece removed by or in the course of chopping, cutting, or breaking, esp. from hard material such as wood or stone. 2. the place where such a chip has been made. 3. a finger of potato deep-fried and eaten hot (cf. <i>French fries</i> . ■ (NZ & Aust.) <u>a thin slice of potato fried until crisp and eaten cold (in Britain usu. called <i>crisp</i>.)</u> 4. a counter used in some gambling games to represent money. 5. (<i>Electronics</i>) = microchip . 6. a thin strip of wood, straw, etc., used for weaving hats, baskets, etc. ■ a basket made from these. ■ (NZ) a punnet. 7. (<i>Soccer etc. & Golf</i>) a short shot, kick, or pass with the ball describing an arc. |
| Junk Food | junk ¹ /dʒʌŋk/ – phrases 1. <u>junk food: food with low nutritional value.</u> 2. junk mail: unsolicited advertising matter sent by post to a large number of addresses or hand-delivered to letter boxes. 3. junk shop: a shop selling cheap second-hand goods or antiques. |
| Lollies | lolly /'lɒli:/ noun (pl. -ies) 1. (NZ & Aust.) <u>a small shaped piece of confectionery made esp. with sugar; a sweet.</u> 2. (<i>colloq.</i>) money. 3. (<i>colloq.</i>) the head. |
| Snack | snack /snæk/ noun 1. a light, casual, or hurried meal. 2. a small amount of food eaten between meals. |
| Wrap | wrap /rap/ noun 1. a shawl or scarf or other such addition to clothing; a wrapper. 2. material used for wrapping. 3. (<i>Cinematog. & Telev. colloq.</i>) the end of a session of filming or recording: <i>that's a wrap</i> . 4. <u>a tortilla enclosing a sandwich-type filling.</u> |

CHAPTER 1: INTRODUCTION

Poor nutrition is a prominent health concern worldwide. In many developed countries diet related illnesses are overtaking smoking related illnesses as the most widespread preventable cause of death (Mokdad, Marks, Stroup, & Gerberding, 2004). Of particular concern is the increasing rates of these illnesses occurring in childhood and adolescence (Must & Anderson, 2003). Diet related health problems which begin in childhood are likely to track into adulthood with increasingly negative consequences (Dietz, 1998; Frankel, Gunnell, Peters, Maynard, & Smith, 1998; Gunnell, Frankel, Nanchahal, Peters, & Smith, 1998; Magarey, Daniels, Boulton, & Cockington, 2003).

Poor health outcomes are related to both insufficient and excess nutritional intake (Flegal, Graubard, Williamson, & Gail, 2005). A large proportion of children fail to consume the levels of vitamins and nutrients recommended by government guidelines (Cavadini, Siega-Riz, & Popkin, 2000; Mannino, Lee, Mitchell, Smiciklas-Wright, & Birch, 2004), while increased consumption of processed carbohydrates and fats have resulted in an overall increase in energy intake across western populations (Reedy & Krebs-Smith, 2010).

The body needs to be supplied with adequate nutrients in order to carry out the many processes required to maintain physical health (Drewett, 2007). Many physiological systems have developed which help to ensure that adequate food intake occurs, particularly in order to survive when food is scarce such as during famine. The ready availability of food in modern developed societies means that these mechanisms can result in higher energy intake than is needed to provide for the individual's energy expenditure (Kearney, 2010; Prentice & Jebb, 2003).

The impact of increasing energy consumption is compounded by decreasing levels of

physical activity required in daily functioning (Jeffery & Utter, 2003). The result of this combination of changes is a trend towards a positive energy balance. Excess energy is stored as a particular type of fat called adipose tissue (Drewett, 2007). Fat has many essential roles in the body; the role of adipose tissue is to serve as a store of energy to be used in times when food is not available. When the energy balance is chronically positive these stores may increase in volume to levels which the body is no longer able to cope with and which then contribute to problems with the functioning of many organ systems (Freedman, Mei, Srinivasan, Berenson, & Dietz, 2007; Gahagan, 2004; Hu et al., 2004).

A diet consisting of energy dense foods can also result in a lack of vitamins and nutrients being consumed, which are usually gained through less energy dense foods such as fresh fruit and vegetables (Bunting & Freeman, 1999). Energy dense foods are more satiating than foods with lower energy density, this means they lead to a sensation of fullness more quickly than less energy dense foods. This is intrinsically attractive as maintaining a high energy-intake has been useful for the survival of our species over millennia. In our current environment, where energy dense foods are plentiful and daily energy requirements are low, this often results in a less varied diet with narrower range of nutrients consumed.

The numbers of children with high levels of adipose tissue, nutrient deficiencies or a combination of both are increasing in both developed and developing nations (Popkin, Adair, & Ng, 2012). The rates of children defined as overweight (Body Mass Index, BMI, score indicating a sufficiently high level of adipose tissue to indicate increased risk of developing health problems) have increased to around three times the levels recorded in 1980 in both the UK and USA (Hedley et al., 2004; Ogden, Flegal, Carroll, & Johnson, 2002; Rennie & Jebb, 2005). In a 2013 New Zealand health survey, 21.6% of children were classified as overweight and 11.1% of children were classified as obese (Ministry of Health, 2013).

The prevalence of overweight and obesity in children is concerning because of the physical and psychosocial harm that is associated with an elevated weight status. Children who are overweight or obese are at increased risk for cardiovascular, endocrine, breathing, orthopaedic and psychosocial problems, both during childhood and later in life (Bell et al., 2011; Must & Anderson, 2003). Studies have found that children with obesity experience greater difficulties in daily functioning, emotional well-being and social interactions than children whose weight is within a healthy range (Friedlander, Larkin, Rosen, Palermo, & Redline, 2003; Williams, Wake, Hesketh, Maher, & Waters, 2005).

The relationship between overweight and obesity in childhood and increased risk of ongoing health problems, combined with the dramatic increases in the prevalence of these conditions over recent decades, has resulted in many initiatives being put in place to try to reduce the number of children becoming overweight or obese (Croker, Lucas, & Wardle, 2012; Johnson, Kremer, Swinburn, & de Silva-Sanigorski, 2012; Khambalia, Dickinson, Hardy, Gill, & Baur, 2012). Most of these initiatives involve educating people about what constitutes a healthy diet and enough exercise, how to maintain a healthy lifestyle and why getting the right food and enough exercise is important for both short-term and long-term health (Centis et al., 2012; Croker et al., 2012; Davison, Jurkowski, Li, Kranz, & Lawson, 2013; DeVault et al., 2009).

The relationships between the eating and exercise habits of individuals, the environment, adiposity and disease are highly complex, with many factors influencing the way the physical and social environments effect particular individuals (Wardle, 2006). Because of this level of complexity, interventions are largely designed to be comprehensive and involve multiple components and delivery methods (Gahagan, 2004). Despite the large body of research into the causes and methods of preventing obesity, the majority of studies have used focus on the BMI of individuals as the only target for change. This has resulted in a lack of evidence regarding what

elements of the social and physical environment play a part in producing health improving changes in diet and exercise behaviours (Birch & Ventura, 2009; Hoelscher, Kirk, Ritchie, & Cunningham-Sabo, 2013).

Definition of Obesity

Obesity in adults is defined as a body mass index (BMI, weight in kilograms divided by height in metres squared) score greater than or equal to 30 (Ogden, Carroll, Kit, & Flegal, 2014). Overweight is defined as a BMI greater than or equal to 25. A BMI between 19 and 25 is classed as healthy and unhealthily underweight is defined as a score of 18 or less. These cut off levels are based on epidemiological studies of the correspondence between BMI and changes in the risk of developing health problems related to varying levels of adipose tissue (Ogden et al., 2014; Schienkiewitz, Mensink, & Scheidt-Nave, 2012). While other methods are available which more accurately measure adiposity, the difficulty in applying these methods to large population studies has resulted in a general agreement among researchers and the appropriateness of defining overweight and obesity using BMI (Barlow & the Expert Committee, 2007).

The relationship between adiposity and health problems is more complex in childhood than in adulthood. While children who are obese do experience higher levels of some health problems than children in a healthy weight range (Bell et al., 2011), the rates of obesity related disease are lower than those in adults (Cole, Bellizzi, Flegal, & Dietz, 2000). Healthy levels of body fat vary throughout the different stages of physical and reproductive development which occur during childhood and adolescence (Cole et al., 2000). Therefore, establishing points which usefully define overweight and obese status in children is a more complex task and a single method of doing so has not been agreed upon across the research (Gahagan, 2004; Troiano & Flegal, 1999).

The majority of recent research uses two definitions of overweight and obesity in

children that are based on different BMI score cut off points. The International Obesity Task Force reference (Cole et al., 2000) is based on the percentile levels of the adult cut offs applied to referent child and adolescent populations. The World Health Organisation standard (de Onis et al., 2007) applies cut offs at the 85th and 95th percentile BMI for age and gender based on five surveys conducted in the USA between 1963 and 1994 (Jolliffe, 2004). The variations between these definitions of obesity result in varying prevalence statistics and data which is not easily comparable (Monasta, Lobstein, Cole, Vigneronová, & Cattaneo, 2011).

This study aims to investigate ways to enhance interventions so that they more effectively improve the dietary habits of children. First, the current literature on the theories of reasons behind food choices, studies of children's food choices and methods used to study these factors is reviewed. Following the literature review, a study of children's food choices across individual and group contexts is described, followed by the results of this study and a discussion of how these relate and add to the current body of literature. Finally limitations of this study and implications for further research are described.

CHAPTER TWO: LITERATURE REVIEW

Theoretical Models of Food Choice Behaviour

The processes involved in choosing what to eat have been studied from a range of perspectives. Each perspective has a different target and purpose, resulting in new theories being developed and existing theories being applied to explain the particular parts of the food choice process that are of interest.

Models of Individual Behaviour

Early models of food choice behaviour were based on research with animals. It was found that animals could quickly learn and apply knowledge about which behaviour would result in the greatest food reward (Herrnstein, 1961, 1970) for the least amount of effort (Pulliam, 1974). When these models were applied to the eating behaviour of humans they were unable to take in to account the complexity of the factors which influence human consumption behaviour (Conner & Armitage, 2002).

The Expectancy x Value (EV) theory is a model which was developed to explain human decision making (Edwards, 1954). The premise of this theory is that “individuals are motivated to maximise the chances of desirable outcomes occurring and minimise the chances of undesirable outcomes occurring” (Conner & Armitage, 2002, p. 25). An individual forms an attitude towards a target behaviour by evaluating the perceived likelihood that performing the behaviour will result in positive or negative outcomes. Positively evaluated behaviours are those which the individual perceives to be more likely to result in positive outcomes.

The Theory of Reasoned Action (TRA), an extended theory of human behaviour based on the EV theory, proposes a mediator between the attitudes held in regard to a behaviour and the likelihood of performing the behaviour. This mediator is defined as the individual’s intention

to perform the behaviour (Ajzen, 1988). A behavioural intention can be described as the amount of effort the individual intends to put in, or how hard the individual is willing to try, to perform the behaviour.

This theory posits that one's attitudes towards performing a behaviour and one's perception of the social pressure to perform the behaviour determine how strongly one intends to perform the behaviour, which predicts the likelihood of the behaviour being performed, or not performed. The individual's attitudes and perception of normative pressures are based on beliefs held about the likelihood of positive outcomes resulting from performing the behaviour, and about the likelihood of performing the behaviour being endorsed by peers.

An individual can hold many different beliefs about a particular behaviour, only a subset of which can be salient at one time (Ajzen & Fishbein, 2000). Different beliefs, about the same behaviour, will be more, or less, salient depending on the context. It is these salient beliefs which predict the individual's attitude towards the behaviour and perception of social pressure to perform, or not perform, the behaviour (Conner & Armitage, 2002). Because the salience of particular beliefs will differ across contexts and for different behaviours, the amount of influence exerted by each factor will differ also. Interventions have been developed which target the salience of beliefs about nutritional value of foods, by providing contextual cues such as advertisements in cafeterias or supermarkets (Glanz & Mullis, 1988).

Many behaviours require some level of skill or ability, an opportunity, or some external resource in order to be successfully performed. The TRA only applies to behaviours that the individual has the power to choose to perform, or not perform. In order to account for the level of control the individual has over whether or not they can, or will, perform a behaviour, Ajzen (1991) added the factor of Perceived Behavioural Control to the TRA, creating the Theory of

Planned Behaviour (TPB).

Perceived behavioural control is the individual's perception of internal and external factors, outside their control, which may act as barriers or supports to the target behaviour being performed successfully (e.g. opportunity, skills and abilities. Ajzen, 2007). The individual evaluates these factors, based on past experience and what is presently anticipated, and perceives the behaviour as easy or difficult to perform in the context (Ajzen, 1991). This appraisal will influence the development of the behavioural intention, as one is less likely to intend to engage in behaviours which are perceived to be more difficult to perform. If additional barriers, or supports, are present that the individual is not aware of then these will not impact the behavioural intention, but will directly influence the likelihood of the behaviour being performed successfully.

A further expansion of the TRA and TPB is the Integrated Behavior Model (IBM. Glanz, Rimer, Viswanath, Montano, & Kasprzyk, 2008). This model integrates constructs from other influential theories to provide a more comprehensive theory of behaviour. In addition to behavioural intention, four other factors are proposed to directly influence the likelihood of the target behaviour being successfully performed, or not performed: possession of the knowledge and skills needed to perform the behaviour, level of environmental constraint, salience of the behaviour and experience performing the behaviour (habit). As well as these additional factors, the factors contributing to the development of the behavioural intention are further defined. A schematic of the model from (Glanz, Rimer, Viswanath, et al., 2008) is reproduced in Figure 1.

Attitude is proposed to be made up of both the individual's feelings about the behaviour, based on previous experiences, and their cognitive appraisal of the likelihood of positive outcomes resulting from the performance of the behaviour (Glanz, Rimer, Viswanath, et al., 2008). These are defined as experiential attitude and instrumental attitude. Attitudes formed from

personal experiences of performing the behaviour are more stable and therefore more resistant to change through social learning. Many interventions targeting eating behaviour focus on increasing nutrition and health knowledge and making it more salient to food choices. Because food choice is a high frequency behaviour it is likely to be more greatly influenced by previous experience and habits formed over time than cognitive appraisal of known health information regarding a particular food choice (Fishbein, 2008).

The IBM accounts for different influences of one's beliefs about the normative behaviour of the population and about the social pressure to perform, or not perform, a particular behaviour, by the inclusion of both injunctive and descriptive norms (Glanz, Rimer, Viswanath, et al., 2008). Injunctive norms refer to one's perception of the amount of social pressure there is to perform, or not perform, the behaviour whereas, the descriptive norm is one's perception of whether others in the population actually perform the behaviour themselves. Descriptive norms have been found to have a much greater influence on eating behaviour than injunctive norms.

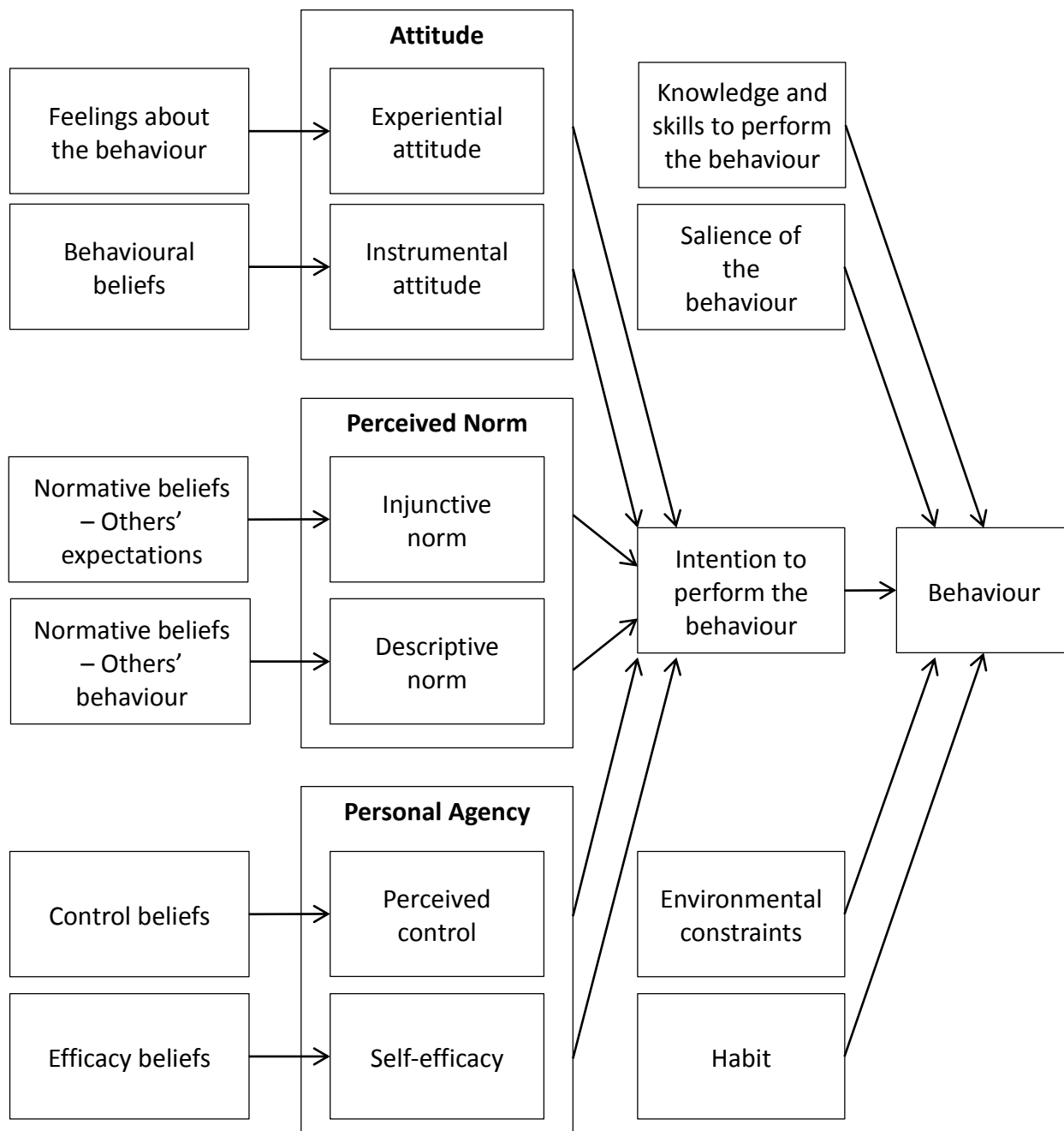


Figure 1. Integrated Behavior Model

Personal agency is made up of perceived control and self-efficacy (Glanz, Rimer, Viswanath, et al., 2008). Perceived control refers to one's perception of how dependent performance of the behaviour is on external factors. Self-efficacy describes the individual's perception of how capable they are of performing the behaviour, including overcoming perceived external barriers. Internal and external barriers which are not perceived by the individual directly influence the behavioural outcome. These factors are represented in Figure 2 as knowledge and skills to perform the behaviour (internal) and environmental constraints (external).

Fishbein (2008) argued for the usefulness of the IBM in assisting the development of health behaviour interventions. The relative effect of each of the main factors in the model can be estimated through analysis of the individual's perceptions and beliefs regarding the behaviour. This allows for an intervention to be targeted towards changing the factor which is expected to have the greatest likelihood of effecting change in the behaviour. The impact of each factor will differ in regards to different behaviours and different contexts, making it more important to determine what factors are having the greatest influence on the particular behaviour of interest in the particular population and context of interest (Fishbein, 2008).

The lack of consideration of the factors influencing the choice to perform, or not perform, particular behaviours may have contributed to the lack of effective interventions to reduce the overconsumption of high energy foods. For example, an intervention to increase nutritional knowledge (attitude) is unlikely to impact on the healthfulness of eating behaviour in a context where healthy food is not accessible (personal agency) or where eating healthily is not perceived to be normal amongst the individual's social group (perceived norm).

Ecological Models

Bronfenbrenner's (1977) ecological theory of human development and behaviour describes the environment as consisting of a series of interconnected, nested structures. These structures, described as layers, consist of different levels of interactions between the individual and their environment. The first layer, the micro system, contains the individual and their immediate situation: the environments with which they interact on an individual level (Bronfenbrenner, 1977). The second layer is named the meso system and contains the interactions between the different environments the individual comes into contact with. These include movements of the individual between contexts and interpersonal links between different environments. The exo system is the nearest layer of influence which does not directly contain the individual. This refers to environments where people who the individual comes into contact with are present, but also environments where decisions are made which affect the individual (e.g. parents' workplaces, school board meetings). The final layer is called the macro system. This layer refers to the belief-systems and associated lifestyles of the subculture or culture the individual lives within.

Factors within these multiple layers interact with one another across time and can influence factors across the layers of the model with which they are in contact (Bronfenbrenner, 1992). For example, the individual influences and is influenced by factors within the immediate social environment. This environment is influenced by links with other environments, and influences other environments through these links. The broader social, political and cultural environment influences, and is influenced to a varying degree by, the behaviour of those within all other layers of the eco system.

McLeroy, Bibeau, Steckler, and Glanz (1988) outlined a variation on Bronfenbrenner's (1977) ecological model, which redefined the layers of influence as containing public policy, community, institutional, interpersonal and intrapersonal factors. This variation was developed in

order to apply the principles of the ecological model to the explanation of health behaviours and the development and implementation of health promotion interventions. An ecological perspective is relevant to the field of public health because health behaviours are influenced strongly by factors outside of the individual. Social and cultural norms largely determine which behaviour choices are available to different populations and individuals in different contexts (Sallis, Owen, & Fisher, 2008).

Glanz and Mullis (1988) conducted a review of the applications of an ecological perspective to healthy eating interventions. They described ecological interventions as those which individuals did not self-select in to and which reached populations by modifying the availability of healthy food, information and nutrition education. The role defined for environmental strategies was to reduce the influence of barriers to healthful eating and to increase opportunities for individuals to engage in healthy eating behaviours. These definitions of ecological interventions are highly relevant for the purpose of designing and evaluating primary-level population-wide interventions as they aim to increase healthful behaviours in all individuals, rather than reducing health damaging behaviours only in those who are considered to be at risk (Sallis et al., 2008)

Another model for the factors influencing the development and maintenance of food choice behaviours is presented by Birch and Ventura (2009). Based on their review of obesity prevention interventions, they outline the importance of findings from epidemiological research of associations between factors at the level of individual behaviour, family systems and community and society. They also emphasised the importance of taking into account the chronological interactions between factors, based on findings that health damaging diet and exercise habits can be developed and maintained from early childhood; an age group not often targeted by multilevel interventions (Birch & Ventura, 2009).

Application to food choice and eating behaviour

Conner and Armitage (2002) outlined a model of factors influencing food choices in which factors within the individual are influenced by their physical and social environment (Figure 2). The combination of these influences results in a particular food being accepted or rejected in a particular instance. Any number of factors, external or internal, may change across time and across different physical and social contexts. Therefore, the model is best able to predict behaviour when each factor is measured in relation to the exact context in which the individual is choosing whether or not, or how, to perform the behaviour (Conner & Armitage, 2002).

This model outlines the factors considered in models of behavioural decision making which are considered to be directly applicable to eating behaviour. By combining contributions from studies of groups and individuals, this model provides a framework for classifying the factors which may be contributing to, or preventing, the effectiveness of eating behaviour change interventions (Conner & Armitage, 2002). The focus on the context in which the choices are made allows us to better understand, and account for, differences in food choices by individuals across different physical, social and temporal contexts, which will help to understand how interventions generalise, or why they fail to.

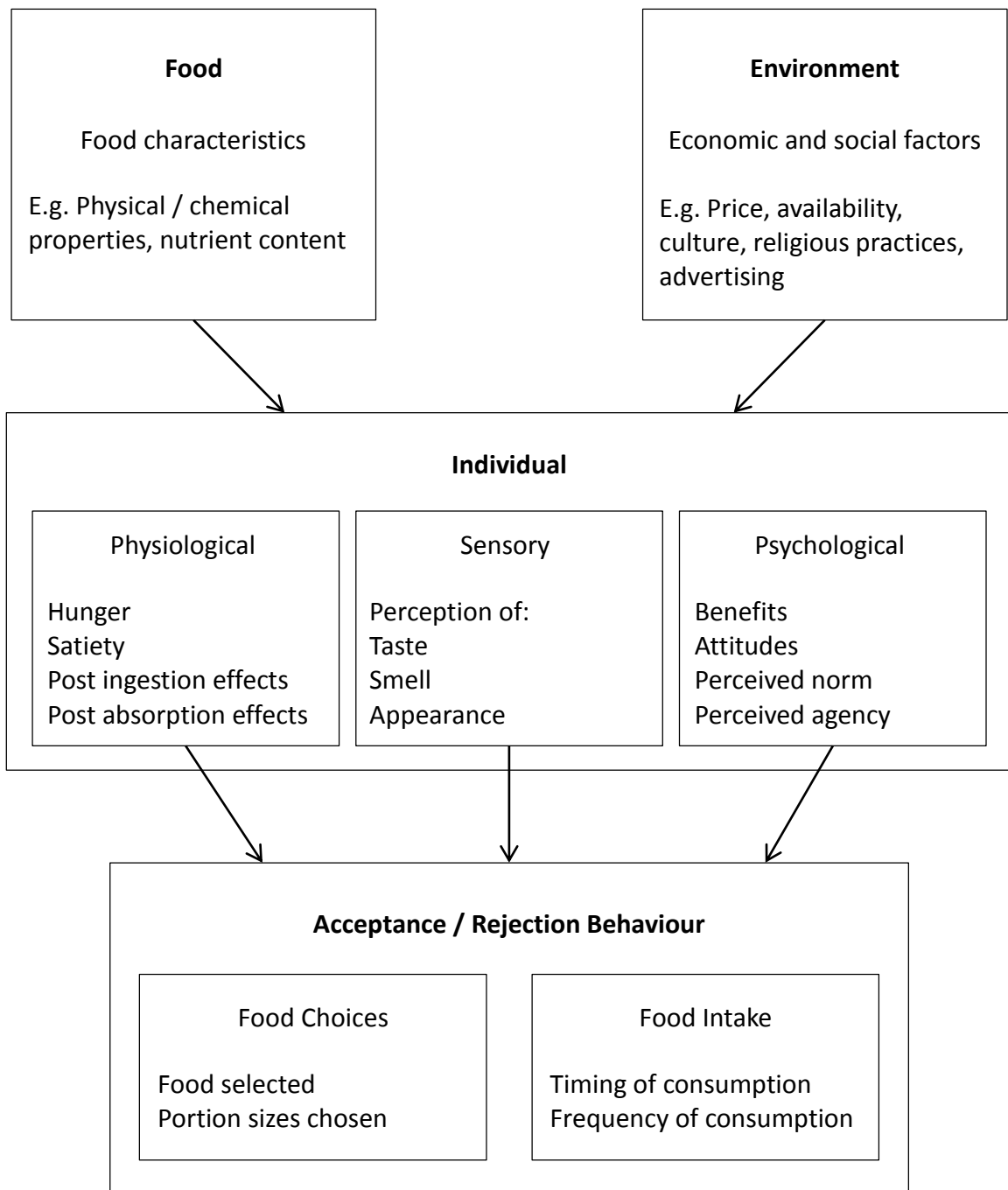


Figure 2. Conner and Armitage (2002) model of factors which influence food choice

Children's food choices

Children live in complex environments where there are many factors that possibly influence their decision making in regard to food choice. Some of the factors which can influence children's diets are: the culture and society they are a part of (James, 1997; Ludvigsen & Scott, 2009), the direct physical and social environment in which they are making their choices (Stewart, Treasure, Gill, & Chadwick, 2006), their perception of the expectations and behaviour of their friends, peers (Cullen, Baranowski, Rittenberry, & Olvera, 2000), family and teachers; their own preferences for particular tastes, smells and textures of food; their knowledge of the nutritional and health implications of eating particular foods (Stewart et al., 2006); and the amount of value they assign to each of these factors (Contento, Michela, & Goldberg, 1988; Crăciun & Băban, 2008; Noble, Corney, Eves, Kipps, & Lumbers, 2001). These factors are not independent; interactions between them result in variations in the choices made by different children across different contexts.

Culture and society

In western cultures there is a widely accepted belief that children's food is different to adults' food (James, 1997). This affects the types of food adults make available to children (Ludvigsen & Scott, 2009). Rozin (1990) described how the types of foods made available to children, by their parents and in organisations such as schools, are influenced by cultural beliefs and traditions. A socially acceptable dietary pattern for children eating with their peers in western cultures involves preferring foods high in fat and sugar. For many children, eating healthy food signifies aligning oneself with the adult social group (Ludvigsen & Scott, 2009). Rozin (1990) described how this pattern was based on the feedback of peers and the types of foods parents and schools made available to children, which are both influenced by cultural beliefs and traditions.

These cultural beliefs about appropriate foods can be seen in the Ludvigsen and Scott (2009) study. The researchers interviewed 174 school children, across three age groups (3-4, 9-10 and 14-15 years) in nursery, primary and secondary schools in the UK, about their lunch food choices. They found that the majority of students ate lunches which conformed to the typical western school lunch, which is based on an expectation of what is socially acceptable for children to eat in a school environment, with their peers, in the middle of the day (James, 1997). The typical home made lunch contained a white-bread sandwich, a candy bar, a packet of chips and a drink (Ludvigsen & Scott, 2009). Only two of the 52 students who brought lunches from home on the day of the interviews did not bring a sandwich; bringing crackers instead.

Immediate environment

A qualitative study of children's understanding of food, by Stewart et al. (2006), found that young children can draw upon information about the healthiness of different foods that they have learned through education and through social contexts, but that the way the students in the study applied their knowledge was dependent on the context they were in. The study was carried out with 74 students aged six and seven and ten and 11 from schools in Wales. The students tended to apply health knowledge at home, where their food choices were moderated by support from their families. Food choice decisions at school were made based on what was socially acceptable in the context of eating with their peers, and did not draw on health knowledge. These authors suggested making changes to the social and environmental contexts in which children eat may improve their dietary habits by prompting them to apply the information they have learned in the classroom to their food choices (Stewart et al., 2006).

Knowledge of nutrition and health implications

Studies have found that children's knowledge of the nutritional value of food does not

influence the healthiness of their food choices at school (Noble et al., 2001; Stewart et al., 2006). Children from as early as age six are able to demonstrate an understanding that some foods are more beneficial for health than others, with increasingly sophisticated understanding developing with age (Stewart et al., 2006).

Noble et al. (2001) asked 123 students, aged between nine and 11, from primary schools in England, to rank foods in order of least to most healthy and in order of their preference. The most preferred foods were those ranked as least healthy and the least preferred foods were those with the highest health ranking. Most of the students in this study were able to demonstrate an understanding of nutrition and health that corresponded with current nutritional guidelines (Ministry of Health, 2012), and talked about concepts such as healthy foods, eating in moderation and a balanced diet. Some even related these concepts to health effects of a poor diet, such as sugar causing tooth decay and fast foods causing weight gain and contributing to heart disease, but these health related factors did not influence their food preferences.

Perceived expectations and behaviour of friends, peers, family and teachers

Cullen et al. (2000) carried out a qualitative analysis of focus group discussions about factors influencing food choices of children. Participants in this study included children from schools in low socioeconomic status areas, in grades 4 to 6 (aged 9 to 12 years), and their parents. The groups were segmented by age and ethnicity in order to compare the data obtained in groups of children and adults, and groups of African-, European- and Mexican-Americans. Parents and children in this study reported that low levels of fruit and vegetable consumption by parents may model this behaviour to children, resulting in low levels of fruit and vegetable intake by children despite these foods being available to them at home. All parent groups reported that they were concerned that their children didn't consume enough fruit and vegetables, and mentioned that despite being provided with these foods in their school lunches,

they often returned home with them, having eaten other, less healthy, foods during the day. Students discussed the negative comments made by peers when fruit and vegetables were consumed at school, although stated this would not prevent them from eating a preferred vegetable.

Ludvigsen and Scott (2009) observed a culture of conformity in students' lunch time eating habits. Students who ate school dinners were seated separately from those who brought their lunch from home, and all students ate similar meals to those they sat with. Stewart et al. (2006) similarly found that students conformed to social norms within both age and gender, with different patterns of eating behaviour seen by males and females and by students of different ages. Some students mentioned that they had tried different food based on what was recommended by their friends or what their friends often ate (Ludvigsen & Scott, 2009).

Children in schools receive negative comments from their peers for eating fruit and vegetables (Cullen et al., 2000), and eating 'junk food', high in carbohydrates, sodium and fats, is seen as socially acceptable, and is reinforced through peer acceptance. In the Ludvigsen and Scott (2009) study, the students mentioned that when someone brought non-standard food to school, such as curries and salads, they would be bullied by their peers and often changed their eating habits to conform with the standard lunch, in order to avoid being persecuted or excluded at lunch time.

In a qualitative study by Stead, McDermott, MacKintosh and Adamson (2011), there was also peer pressure for students bringing food from home to bring appropriate brands of food. This study analysed the focus group discussions of 80 students in England, aged between 13 and 16 years, using thematic analysis. The themes identified were: meaning and judgements carried by food choices; the presence of approved and stigmatised brands; and risk to social status

associated with being seen to eat a healthy diet. Students talked about not wanting to bring low cost brands of food to school as this would demonstrate to their peers that their parents couldn't afford luxury brands.

In addition to pressure to eat child appropriate foods, there is an increasing pressure across childhood towards more health conscious eating. For males this is often related to eating a diet that provides enough energy for keeping up with sports performance (Backman, Haddad, Lee, Johnston, & Hodgkin, 2002). For females this can relate more to maintaining a socially acceptable body shape (Lindner, 2008) and particular health messages specific to maintaining health in adulthood. An example of this is public health messages from the 1990s encouraging consumption of milk products during adolescence to increase bone mineral acquisition and prevent osteoporosis during pregnancy and later in life (Cadogan, Eastell, Jones, & Barker, 1997).

Preferences for particular tastes, smells and textures of food

Preference for sensory aspects of food was found to be an important influence on food choice in all of the studies reviewed. Ludvigsen and Scott (2009) found that all participants in the younger age ranges (aged 3-4 years and 9-10 years) ranked taste as the most important factor when they were choosing what food to eat. The importance of choosing foods which are appealing to the individual on a sensory level was seen in several studies to override the influence of other factors, such as health (Ludvigsen & Scott, 2009; Noble et al., 2001) and social norms (Cullen et al., 2000; Stead et al., 2011; Stewart et al., 2006). Atik and Ertekin (2011) conducted interviews and focus groups with children aged between seven and 11 and parents in Turkey and found that parents perceived a far broader range of influences on children's food choices than the children themselves, for whom sensory appeal was a critical factor in forming preferences.

Value assigned to each of these factors

In a study of students' motivations for food choices, Contento et al. (1988) used a consumer analysis strategy to segment a sample of New York students (n=355), aged 11-18 years, based on their food-choice motivations. They utilised an Expectancy x Value model of motivation (Lewin et al., 1944), which predicts that people will "choose foods on the basis that eating these foods will bring about consequences they desire" (Contento et al., 1988, p. 290). A within subjects methodology was used to examine the correlation between the individuals' motivation to eat a range of different foods with their food consumption, reported using a 24 hour recall procedure.

Students were asked to rate their beliefs about the tastiness, healthfulness, likelihood to cause heart disease, ease of acquisition, popularity among family and friends, and level of sugar and fat in relation to 20 foods using a Likert scale. They then rated how often they ate the same 20 foods on the same scale. On a separate occasion they were asked to rate the same attributes as bad or good on a Likert scale, and then to use poker chips to demonstrate how influential each of the eight attributes were on their food choices. In addition, each student reported their food consumption over a 24-hour period to the researchers three times; once in person and twice via telephone.

A cluster analysis was carried out, which grouped participants by the patterns of correlations between their ratings of food choice motivators and actual consumption habits. Five clusters were identified with similar profiles of the level of influence of different motivators, and one other cluster, which showed low correlations to all food choice and environmental factors. The highest correlation coefficients across the first five groups were with the 'taste' (ranging from .53 to .74) and 'parents serve it' (.52 to .77) influencing factors. The healthful factor

showed the greatest variation across the groups with correlation coefficients ranging from .28 to .70. The researchers suggested that other factors, not identified in the study, may be influencing the food choices of the participants in this sixth cluster (Contento et al., 1988).

The students in the cluster with the lowest healthfulness correlation also showed the highest correlation with the taste, friends eat it, fattening, has sugar and causes heart disease factors. This indicated that these students did not consider the healthfulness of foods when making food choices and that they chose foods they knew to be high in sugar, fattening and detrimental to health more than any of the other students. This group was labelled “Hedonistic” by the researchers because of their apparent interest in enjoyment of food over all other factors. A second cluster also showed greater influence of taste and environmental factors over healthfulness factors of food. This cluster was labelled the “Social/environmental control” cluster as they were influenced most by what parents served and what was easy to get. This group was also influenced by what friends ate and taste more than they were by the healthfulness of food.

Three clusters showed positive correlations with the healthfulness of foods. The cluster with the highest correlation with healthfulness was also influenced by what parents served more than any other cluster. This group was labelled “Parent-supported health” by the researchers. These students were the least influenced by what their friends ate of the participants in this study. Another cluster showed a positive correlation with healthfulness of foods and also a positive correlation with what friends ate. This cluster was labelled “Peer-supported health” as they were influenced by the eating habits of their peers and also ate foods which they knew to be healthy and avoided fattening, sugary and heart disease causing foods. The third cluster with a positive healthfulness correlation was labelled the “Personal health” cluster by the researchers due to the high influence of the healthfulness of foods and relatively low influence of the taste, easy to get

and parents serve it factors compared with all other clusters.

An analysis of the demographic characteristics of the participants in each cluster showed that no particular cluster was associated more with any gender or ethnicity. The clusters did vary by age of participants. Adolescents dominated both the hedonistic and parent-supported health groups. Pre adolescents were prevalent in both the socially/environmentally controlled and personal health groups. The clusters including more adolescents are those at both extremes of the health vs. taste continuum. The clusters including more preadolescents were characterised by more moderate correlations, indicating that the range of factors influencing the choices of students in this younger age range may be more diverse, and attitudes less extreme, than those considered important by older students.

The researchers suggested that it may be beneficial to match nutrition educational strategies to the food choice motivation patterns of individuals. The factors identified here can be placed along a continuum. At one end are students whose motivations were highly hedonistic, where taste, environmental and social factors had the greatest influence, and at the other are those students whose food choices are motivated by the health consequences of their choices. Interventions could be targeted to each of these two categories. A simple screening device could be developed for use in the classroom to determine which students fall into each category.

Children studied in previous research

A range of methodologies have been used to investigate the food choices of children and adolescents. These are examined below and their strengths and difficulties discussed.

Socioeconomic differences

Bunting and Freeman (1999) found that for 482 children, aged between 5 and 11 years, in primary schools in Northern Ireland, intake of healthy food at morning break time was directly

correlated with the socioeconomic status (SES) of the school's surrounding area. The children from more disadvantaged schools ate more sugary confectionary and crisps, and drank more soft drinks. Children from less disadvantaged schools ate more fruit and bread and drank more water and milk at their morning break (Bunting & Freeman, 1999). In a survey of 2,237 adolescents, aged between 11 and 16 years, and their parents, in Scotland, Sweeting and West (2005) found that family structure and family eating habits had less impact on the adolescent participant's dietary intake than socioeconomic factors such as their mother's level of education and the level of economic deprivation in the area where they were living.

In a nation-wide survey of 9,107 New Zealand high school students, Utter et al. (2011) found that consumption of unhealthy food, such as chocolates, fast food, soft drinks and chippies, was higher among students who lived in lower SES areas compared to students who lived in higher SES areas. Students from the higher SES areas were more likely to eat breakfast and lunch and had more regular access to fruit and vegetables than those living in low SES areas. The differences in food choices and access to healthy food were not found to be due to the students' motivation to eat healthily or support for healthy eating in school as these factors did not differ between the high and low SES areas. SES in this study was defined using school decile ratings which range from one, meaning low SES, to 10, meaning high SES, based on the average household income in the area surrounding the school (Utter et al., 2011).

Gender differences

In a survey of 1,418 elementary, middle and high school students the USA, Caine-Bish and Scheule (2009) found that girls and boys differed in their preferences for school lunch foods. Overall, the girls preferred sweet and starchy foods (such as donuts, muffins and French-fries) and fruit and vegetables more than the boys. The boys showed a greater preference for ethnic food (such as fajitas and tacos), and animal protein based foods such as fish, casseroles, beef,

pork and barbeque. The differences in preferences were not consistent across the age range with the greatest difference in food preference found in middle school students for almost all categories of food. There was little difference for the elementary-school-age group but the boys preferred fast and familiar foods.

Atik and Ertekin (2011) and Ludvigsen and Scott (2009) both found that there was a tendency for girls to make healthier food choices than boys. Studies with adult populations have shown that female targets are rated as more attractive and more feminine when they are shown to consume small meals (Chaiken & Pliner, 1987) and have a lower than average body mass (Martins, Pliner, & Lee, 2004). Chaiken and Pliner (1987) found that ratings of masculinity for male targets were not affected by the amount of food they were shown to consume. The researchers from these two studies inferred that females may be motivated to restrict their food intake in order to portray a more feminine social identity.

Increased social pressure on girls to eat healthily to maintain a low weight has also been shown in studies of pre-adolescent and adolescent students. In Neumark-Sztainer, Falkner, Story, Perry and Hannan's (2002) study of 4,746 middle and high school students in Minnesota, weight related teasing was more commonly reported among female than male participants. Fifty seven percent of female participants and 64% of male participants reported that they had never been teased about their weight. Prevalence of weight related teasing by family members was far higher among females (29%) than among males (16%).

Forty five percent of the 1,533 young adult women who participated in a study by Quick, McWilliams and Byrd-Bredbenner (2013) experienced weight-related teasing between the ages of 6 and 16 years old. Seventy two percent of participants had a BMI score within the normal range at the time of the study. The prevalence of extreme weight modification behaviours

(restrictive diets, induced vomiting following meals and excessive exercise) were higher for the participants who reported experiencing weight related bullying.

Age group

Much of the research on social interaction around food choices with pre-adolescents has focused on the influence of the family context because this is seen as the most influential environment for young children. Parents are seen to have a large amount of control over the foods which their pre-adolescent children eat (Atik & Ertekin, 2011; Holsten, Deatrick, Kumanyika, Pinto-Martin, & Compher, 2012). Due to their increasing independence from families and reliance on peers for interaction and social support, the influence of peers on food choices has been investigated with adolescent samples.

Contento et al. (2006) interviewed high school students individually, using a simulated lunch choice task and open questions. The students in this study largely conformed to the expectations of their peers regarding food choices at school and described this as a conscious decision in order to fit in.

As Ludvigsen and Scott (2009) found, younger children do not consider themselves responsible for their food choices. Atik and Ertekin (2011) described children's understandings of the consequences of food choices as different for adults and children. The children in the study referred to adults as being at greater risk of poor health outcomes as a result of unhealthy eating. They also demonstrated a more simplistic understanding of the reasons for, and consequences of, eating particular foods such as linking poor health outcomes to the consumption of individual food items and binary rules of good and bad foods and healthy and unhealthy foods.

New Zealand literature

Dresler-Hawke, Whitehead and Coad (2009) studied the foods New Zealand children ate in their school lunches. The lunchboxes of students at schools in the Manawatu were photographed at the beginning of the day, and food bins were provided for leftovers at meal times, to determine what foods had been brought to school, and what had been consumed. They found that the majority of the students sampled brought white bread sandwiches to school, and that the majority of lunches contained high levels of sugar and sodium. Most students brought at least one piece of fruit or vegetable to school, but these were the least consumed food groups, making up the majority of the food in the waste after lunch time.

In a second study, 1,184 students, in eight primary schools in the Manawatu region, completed a hypothetical lunch choice survey (Dresler-Hawke, Whitehead, & Parker, 2011). Illustrations of the most common foods from the Dresler-Hawke et al. (2009) study were provided for students to choose from for, on separate occasions, a dream lunch box and a healthy lunch box for themselves. The results showed that the students were able to construct a healthy lunch box, containing fruit and vegetables, but that despite this, their dream lunch boxes predominantly contained snack foods which were high in sugar and sodium.

The results of these two studies showed that the NZ primary school children who participated were able to understand the concept of healthy food, and indicated that they were capable of choosing healthy food when asked to do so, but that this knowledge did not lead to them preferring healthy foods, or choosing to eat a healthy lunch at school. Even when parents provided a healthy lunch, the healthiest components, the fruit and vegetables, were often discarded during the school day (Dresler-Hawke et al., 2009).

Simulated lunch choice task

Contento et al. (2006) used a simulated lunch choice procedure to examine the school

lunch foods chosen by 108 high school students from 12 schools in the USA. The task also provided information regarding the order of their choices, and the reasons that motivated them to make those choices. The first food item the students chose was the main component of the meal and subsequent foods were chosen based on what would go well with the first food and what would balance the healthiness of the meal. Students chose foods in a particular order and created lunches which followed a typical structure: a meat type item, an item which is culturally perceived as a complement to the first item, a beverage and a dessert.

These results indicated a specific set of unspoken rules about what combination of lunch foods are socially acceptable in the school lunch context, resulting in a standard lunch similar to those found in the study by Ludvigsen and Scott (2009). The similarity found between the lunches produced by students in the simulated choice task in the Contento et al. (2006) study and those observed in the study by Ludvigsen and Scott (2009), indicates that the simulated-lunch-choice task provides a realistic representation of what children would normally eat in their school lunch. These studies were based in schools where students chose their lunches from a set menu in the school cafeteria. In this situation, the same foods are made available to all students, and therefore, parental influence and individual preference do not affect which foods are available for the students to choose from.

Because the majority of New Zealand schools require students to bring packed lunches from home, it is more likely that the values of parents will have an impact on the foods made available for students to include in their lunches. In the Dresler-Hawke et al. (2011) simulated lunch choice study, the students chose food for their dream lunch boxes which closely resembled the actual eating habits of the students in their previous lunch box analysis (Dresler-Hawke et al., 2009). The fruit and vegetables, from the lunch boxes of the students in the 2009 study, were largely discarded, and the rubbish in the bins contained wrappers from unhealthy snacks, which

were bought at school from cafeterias and vending machines, indicating that the availability of alternative foods moderated the influence of parents' expectations on the eating habits of children in school. These results indicate that there is a strong resemblance between the choices made in the Dresler-Hawke et al. (2011) simulated lunch box food choice task and the actual eating habits of the students in the previous Dresler-Hawke et al. (2009) study. They also indicate that a simulated-choice survey may provide more information about the school time diets of primary school children than a survey of foods brought to school in their lunchboxes.

Co-operative Learning Groups

Learning in a classroom can be done cooperatively, individualistically or competitively (Brown & Thomson, 2000; Johnson, Johnson, & Holubec, 1993). In a cooperative environment successful achievement of group goals is based on the effective contribution of all members of the group (Deutsch, 2011). Working together, encouraging and rewarding the effort of others results in greater achievement of all group members. In an individualistic environment achievement is measured against a pre-established criterion and each individual works towards the criterion. Success of each individual depends on their own effort and is not dependent on the success or failure of others; no interaction with others is necessary. In a competitive learning environment success is norm referenced so the success of an individual is measured by their ability to outperform other members of the group. In this environment the individuals are in competition with one another to achieve a goal which can only be attained by one or a few individuals. In this environment interactions between individuals serve to decrease the likelihood of others succeeding in order to raise the power, status, and likelihood of success, for oneself.

Johnson, Johnson and Holubec (1993) describe positive interdependence as an important factor for effective cooperation within a group. This term describes a situation in

which each group member's efforts are required for group success and each group member has a unique contribution to make to the joint effort because of the resources and task responsibilities they are assigned. To encourage positive interdependence a task should be set which is measurable and achievable by the group. Strategies to increase positive interdependence during task work include: requiring the group to produce a single product; assigning group members roles or responsibilities which are complementary and interdependent; and assigning each group member a portion of materials necessary for completing the task so that the resources of all group members must be combined in order for the group to be successful in achieving its goal (Brown & Thomson, 2000). Setting up a group task in this way ensures that the involvement and contribution of each group member is necessary for completion of the task.

Study Aims

After reviewing the literature it is clear that there is a scarcity of research into the influence of a social school environment on the food choices of pre-adolescent children. Research into this area is needed because the influence of peers increases quickly across middle childhood to the high level of influence seen from peers in adolescence. The eating habits of primary school age children are strongly influenced by their parents. However from 5 years of age students eat five meals a week together in school. In this school lunch environment they are involved in complex social interactions and are influenced by the attitudes and behaviours of their peers (Contento et al., 1988; Ludvigsen & Scott, 2009; Ross, 1995). This study will address this gap in the current knowledge base, guided by the following research questions.

Research Questions

1. What food do students select on a simulated lunch choice task and why?
 - a) How do choices differ between children at schools with different decile-ratings?
 - b) How do choices differ across the age range?

- c) What reasons do children select for the choices they make?
- 2. What foods do students choose when completing a simulated lunch choice task in groups?
 - a) How do these group choices differ from choices made individually?
 - b) What reasons do groups of children select for the choices they make?
 - c) How do these reasons differ from those selected when choosing individually?
- 3. Do students influence each other during the decision making process in a simulated lunch choice task through their social interactions?
 - a) How does this occur?
 - b) What are the topics of conversation?
 - c) How do children of different social groups (male or female, high or low SES, younger or older) discuss different topics?

CHAPTER THREE: METHOD

This study used a mixed methods design. Data was collected on the food choices of children in the context of choosing food to include in a hypothetical school lunch-box. A survey completed by participants both individually and in a group context provided information about the types of food the participants chose and their reasons for making those choices. Video and audio recordings were made to sample the interactions between participants while they made choices in the group survey. Participants learned to produce a stop-motion animation during the data collection session. This activity served as a context for collecting the survey information, which was enjoyable for the participants and a transferrable skill.

This chapter will describe the ethical considerations in the design of the study, the recruitment process and the participants, the two versions of the survey used for collecting food-choice data, the methods for the collection of the qualitative data, the procedure followed during the collection of the data and the strategies adopted for analysis of the resulting data.

Ethical Considerations

The principals, teachers, parents and participants involved in the study were given information sheets outlining the purpose and procedure of the study. These were written specifically for the different individuals for whom they were intended in order to present this information in an accessible and useful way. The info sheets outlined the purpose of the study and the role of the individuals involved. Principals, teachers, parents and participants then completed a consent form, providing written consent for participation in the study. These information sheets and consent forms have been reproduced in Appendix A. Ethical approval for this study was granted by the University of Canterbury Human Ethics Committee. A copy of this letter is presented in Appendix B.

Food was not provided for the students to eat as part of the activity as the majority of parents in New Zealand play a part in regulating what food is available to their children at school and it was considered probable that some parents may object to food being provided for children to eat as part of the project. The activity was carried out using images of food as throwing away uneaten food after the activity could be considered wasteful and it is inappropriate in some cultures to use food for purposes other than eating.

The incorporation of the stop-motion video task into the research project provided an enjoyable learning experience for students, reducing the potential for the data collection session to interrupt learning in the classroom, and making the experience worthwhile for the students and teachers. The completed animations were given to the teachers at the end of the study. This activity was highly entertaining for many of the students, as the Lego movie (Miller & Lord, 2014), a feature length family film incorporating stop motion animation, was released during the data collection phase. This both increased the enthusiasm for participating in the study and provided a structure that enabled the effective gathering of the group survey and interaction data.

Recruitment, Participants and Settings

Twenty-four school principals were invited by email for Year 5 to Year 8 classes to participate in the study. Three schools responded and in total 109 students (62 males, 44 females) from five classes participated. The age of the participants ranged from 7 to 13 years with a mean age of 10.32 years ($SD=1.24$). Age and gender data were missing for three participants.

Four of the classes were of mixed year groups, two included students in their fourth, fifth and sixth year of school, and two consisted of students in their seventh and eighth years. One class consisted of Year 5 students only. The socioeconomic status of the three schools was estimated based on their decile ratings, which are classification of schools based on census data

of the mean income level in the surrounding area. These covered medium to high decile ratings of 6, 8 and 9. Each school varied in their educational philosophy. One was a mainstream public school and the other two were designated special character schools: one a faith based/church affiliated school, and the other a progressive school incorporating innovations in teaching and learning.

Measures

Individual Survey

The survey used was based on one designed for the Dresler-Hawke et al. (2011) study. The original survey contained instructions, 40 squares containing names and illustrations of foods and two empty squares. This was modified for this study to include information about the order of food selections made and a second page was added, providing information about the reasons for each food choice. The modified survey consisted of two pages, printed in colour on both sides of one sheet of A4 paper. A copy of the survey used in this study is presented in Appendix C.

The first page showed a set of instructions for filling in the survey, illustrations of 40 foods to choose from and two empty spaces for additional food choices to be added. The flip side consisted of a second set of instructions and 11 reasons for the food choices, based on motivations found in qualitative and quantitative research (Contento et al., 1988; Ludvigsen & Scott, 2009; Ludvigsen & Sharma, 2004; Michela & Contento, 1986). One empty square allowed participants to write additional reasons for their choices.

Group Survey

A second survey was designed to be completed by groups of participants. The aim of this survey was to collect the same information as the individual survey in the context of a group

activity. The layout of the survey was adapted to make it easier to use in the group format. A box at the top of the survey was provided for the names of the group members. A line was provided for the name of each food selected to be written. Under each food item, the same 11 reasons as used in the individual survey were provided with boxes beside them to be ticked if the reason was selected. Space was provided for six items, over two sides of an A4 sheet of paper. This survey is reproduced in Appendix D. For the group survey, the same 40 food items used in the individual survey were represented by colour photographs printed onto white card. Instructions for completing the reporting form were provided on a separate sheet that also provided instructions for producing the stop motion animation. A copy of the instructions is presented in Appendix E.

Interaction data

Video and audio recordings were made of one group in each classroom during the group activity in order to sample the interactions that occurred during the group food-choice process. The groups to be videoed were chosen based on which was located in the area of the classroom where the best quality recording could be made. In most classes, the videoed group were located near a wall and the furthest distance from other groups. The teachers allocated the groups to a space before the location of the camera was determined. The camera was set up so that all members of the group were visible in the video and in a position so that the target group were the nearest to the microphone. In the last classroom, a voice recorder was placed on the table beside the videoed group so that a clearer quality audio recording could be made. This made the transcription easier as there was less background noise disruption and the origin and content of the speech could be triangulated with the video recording from the camera.

Stop-motion animation

Each group of participants produced a short stop-motion animation of food moving into a lunch box, using pictures of the food items selected for the group survey. The instructions for this task were based on the principles of cooperative learning as it was determined that this would help to increase the likelihood of the groups functioning well together to complete the task. Teachers were asked to divide the class into groups containing students varying in age and gender. Each student was randomly selected to perform a different role in the group, all of which were required for completion of the survey and animation, in order to maximise the likelihood of the task being completed successfully with all students involved in the process (roles defined p. 42). Each group had an instruction sheet, a set of food pictures, a lunch box background, an iPad and an iPad stand. The animations were produced using iStopMotion (Boinx Software Ltd., n.d.) on the iPads. Instructions provided to students on producing the animation can be found in Appendix E.

Procedure

Information sheets were distributed to principals when they were approached to participate in the study and consent forms were sent to those who indicated that they were interested in having their school participate. Consent forms and information sheets for teachers, parents and participants were sent to the classroom teachers, who then sent parent and participant forms home with the students in their classes. All student consent forms from each class were received prior to the data collection session. Data collection was carried out during one-hour sessions in each of the five classrooms during terms two and three of 2014. The timing of the sessions during the day was decided by the teacher and these occurred at varied times of the day including beginning of the day, before the morning break, before the lunch break and after the lunch break.

The classroom teachers introduced the researcher to the classes and remained in the

classrooms throughout the sessions. In one classroom a relief teacher was teaching the session. The researcher asked the participants to sit in a position where they could see the board and hear the instructions before explaining the purpose of the study and presenting a demonstration of how to complete the individual survey. An A2 sized example survey was used for the demonstration, which used a choice of animals to have as pets, instead of food for lunch, to prevent the selections made in the example from influencing the choices made by the participants. The survey was attached to the whiteboard at the front of the classroom using either blutack or magnets and the researcher read the instructions aloud to the participants and then completed the survey using a black marker pen.

The researcher distributed a copy of the individual survey to each participant (a copy of the survey can be found in Appendix C). The researcher instructed the participants to record their name and age on the survey form and then read aloud the instructions which asked them to choose as many items as they would like to include in their lunch box for school and record their choices by writing a number on top of the picture of each food item they chose on the first page to indicate the order of their choices and to use the two empty squares to add any items they wanted to include that were not included on the survey. After four minutes the researcher asked the participants to raise their hand if they had completed the first page of the survey. Once all of the participants had completed the first page, the researcher asked them to turn over the page to look at the second page of the survey. The researcher and class teachers provided assistance to students on the procedure of completing the survey when requested.

The instructions from the second page of the survey were read aloud. Participants were instructed to indicate the reasons for each food choice by writing the number assigned to the food on the first page on the box on the second page that contained the reason that pertained to the choice of that food item. They were told that the extra square may be used to add a reason

that had not already been provided. No limit was given for the number of foods that could be selected or the number of reasons for each food choice. Five minutes was allowed for completion of the second page of the survey, after which time the survey forms were collected.

Immediately following the individual survey, the classroom teachers divided the participants into groups of no more than five participants. The group activity was structured according to the principles of co-operative learning theory. Teachers were asked prior to the session to include in each group students with a mix of ages and genders. They were also asked to use their knowledge of the relationship of the students and dynamics of the class to choose groups that would work well together. Where classes had previously allocated groups for doing group work and these were used for the activity. The researcher assigned each student a role for completing the group survey form and producing the stop-motion animation video. Each group was assigned a photographer, a director, a recorder, a leader and a timekeeper. In the smaller groups, some participants were assigned to more than one role.

The researcher then gave each group a group-survey form, an iPad, a stand, a set of food pictures, a lunch-box picture, blutack and a sheet of instructions outlining the process of completing the survey form and producing a stop motion animation using the materials provided (reproduced in Appendix E). The iStopMotion programme was open on the iPads with a new project started. The researcher demonstrated to each group how to set up the iPad in the stand and the lunch-box picture on a desk. The iPad stand and lunch box picture were blutacked to the desk to reduce movement during the filming which would cause the background image in the animation to jerk about. The stand was placed facing towards the lunch box picture with the picture filling the screen, ensuring a minimum amount of the background desk or classroom was visible as movement behind the image would show as things appearing and disappearing in the animation. A photo of the way the iPad and pictures were positioned is in Figure 3 below.

The stop-motion animations were produced by the participants placing an image of a food item of near the lunch-box picture and taking a photo then moving the image slightly and taking another photo. This process was repeated until the item was in the middle of the lunch box. Each item was photographed moving in to the lunch-box in this way. Groups that completed the basic animation and the survey recording form quickly were assisted to produce additional videos with food items moving faster or slower, by adjusting the rate of frames displayed per second, and appearing and disappearing, by alternating photos of the item in the lunch box and the lunch box empty.



Figure 3 Example of stop-motion animation set up

The researcher explained how to complete the survey to each group. Instructing them to take a vote to ensure the majority of group members agreed on the items included in the lunch. The strategy for narrowing down choices was left for the participants to negotiate except in the cases where it appeared the group members were struggling with this process and may not complete the activity in time. In these cases the teacher or the researcher explained the process of voting or modelled this by asking the group members to vote for items and counting the for and against votes before turning the responsibility for this process back to the group members.

Groups were informed that they had 45 minutes to complete both the group survey and stop-motion animation video. Time remaining was displayed on a projector screen using a projector and a timer programme on an iPad. Participants chose six foods, from 40 options, and wrote the name of each food in the space provided on the survey. They placed a tick in the box beside each reason they considered relevant to each food choice.

Data analysis

Survey data was analysed using SPSS Statistics Version 22 for Windows (IBM Corp., 2013). The descriptive module of SPSS was used to identify the frequency of demographic variables and food choices for both individuals and groups. The distributions of these frequencies were assessed visually and linear relationships between variables were analysed using Pearson's correlations (Aron, Aron, & Coups, 2009).

Food choices were collapsed from individual items into food-groups, based on food types defined in the Dresler-Hawke et al. (2011) study. Correlation coefficients were calculated to identify patterns of similarity between food choices and demographic variables: age, gender and SES. Participants with missing data (n=3) were excluded for the analyses based on the missing variables.

A rank order analysis (Aron et al., 2009) was used to compare the number of participants who chose each food item and items from each food group in the individual and group surveys. This method of analysis was selected because of the counted nature of the values being compared.

Interaction data from the recordings of the group survey were transcribed and their interaction patterns described. The discussions were analysed thematically based on trends identified in the differences between the individual and group survey results. The findings from this analysis were used to provide additional information regarding the context in which the food choices were made and are reported in the Discussion chapter.

CHAPTER FOUR: RESULTS

Survey data were input in to SPSS (IBM Corp., 2013). The results are presented in tables comparing the number of participants who chose each food, and the number of participants who chose foods from each food group, in the individual and group conditions. Following this comparisons of the choices of male and female participants, participants in the younger (7-10 years) and older (11-13 years) age ranges and participants from the decile 6, 7 and 9 schools are presented. Finally, the reasons selected for the choices made in the individual and group surveys are described.

Individual and Group Food Selections

The number of participants who selected each food on the individual and the group survey were obtained using the descriptive module in SPSS (IBM Corp., 2013). The most commonly chosen food items in the individual survey were chippies, apple, chocolate bar, strawberries, sandwiches, donut, pizza, pineapple, grapes, mandarin, cookie and carrots. The most commonly chosen foods in the group survey were wraps, strawberries, chippies, grapes, sandwiches, mandarin, apple, carrots, pie, pizza, pineapple and donut. The most commonly selected foods, and the number of participants who selected each, are presented below in Table 1.

The same seven fruit and vegetable items appeared in the top 15 choices for both individual and group lunches: apple, strawberries, grapes, pineapple, mandarin, carrot and banana. The most commonly selected item in the group survey was wraps, a 'savoury main', while chippies and chocolate bar, as well as apple and strawberries, were chosen more often than the most popular savoury main item on the individual survey, which was sandwiches.

Table 1

Most frequently selected foods in the individual survey (n=109) and in the group survey (n=104), the number of participants who chose each food and the percent of the sample

| Rank | Individual | | | Group | | |
|------|---------------|----|-----|---------------|----|-----|
| | Food | N | % | Food | N | % |
| 1 | Chippies | 43 | 39% | Wraps | 55 | 53% |
| 2 | Apple | 42 | 39% | Strawberry | 44 | 42% |
| 3 | Chocolate Bar | 41 | 38% | Chippies | 42 | 40% |
| 4 | Strawberry | 41 | 38% | Grapes | 36 | 35% |
| 5 | Sandwiches | 40 | 37% | Sandwiches | 35 | 34% |
| 6 | Donut | 39 | 36% | Mandarin | 32 | 31% |
| 7 | Pizza | 35 | 32% | Apple | 31 | 30% |
| 8 | Pineapple | 33 | 30% | Carrots | 30 | 29% |
| 9 | Grapes | 30 | 28% | Pie | 27 | 26% |
| 10 | Mandarin | 30 | 28% | Pineapple | 26 | 25% |
| 11 | Cookie | 29 | 27% | Pizza | 26 | 25% |
| 12 | Carrots | 28 | 26% | Donut | 24 | 23% |
| 13 | Wraps | 28 | 26% | Croissant | 22 | 21% |
| 14 | Banana | 26 | 24% | Cookie | 21 | 20% |
| 15 | Pie | 26 | 24% | Banana | 19 | 18% |
| 16 | Biscuits | 24 | 22% | Bread Roll | 18 | 17% |
| 17 | Fruit Strings | 24 | 22% | Cucumber | 16 | 15% |
| 18 | Muffin | 24 | 22% | Chocolate Bar | 14 | 13% |
| 19 | Cake | 23 | 21% | Lollies | 13 | 13% |
| 20 | Croissant | 22 | 20% | Nuts | 12 | 12% |

Foods were grouped by type according to the groups defined in the Dresler-Hawke et al. (2011) study and ranked according to the number of participants who included one or more item. The number of participants who chose foods from each food group is displayed in Table 2 along with the corresponding percent of the sample. The four most popular food groups were ranked in the same order in both the individual and group surveys: main was the most popular, chosen by 94% of participants in the individual survey and 100% in the group survey; next was fruit, included in 82% of individual lunches and 92% of the group lunches; followed by savoury snack, chosen by 65% of individuals and 57% of groups; and Baked Goods, chosen for 62% of individual lunches and 52% of group lunches.

Table 2

Most frequently selected food groups in the individual survey (N=109) and in the group survey (N=104). The number of participants who chose each food and the percent of the total sample

| Rank | Individual | | | Group | | |
|------|---------------|--------|---------|---------------|--------|---------|
| | Food Group | Number | Percent | Food Group | Number | Percent |
| 1 | Main | 102 | 94% | Main | 104 | 100% |
| 2 | Fruit | 89 | 82% | Fruit | 96 | 92% |
| 3 | Savoury Snack | 71 | 65% | Savoury Snack | 59 | 57% |
| 4 | Baked Goods | 68 | 62% | Baked Goods | 54 | 52% |
| 5 | Junk Food | 65 | 60% | Vegetables | 37 | 36% |
| 6 | Vegetables | 45 | 41% | Junk Food | 27 | 28% |
| 7 | Sweet Snack | 36 | 33% | Dairy | 12 | 12% |
| 8 | Dairy | 30 | 28% | Sweet Snack | 5 | 5% |

The order of popularity of the Junk Food, Vegetables, Sweet Snack and Dairy food groups differed between the individual and group surveys. The fifth ranked food group in the individual survey was junk food and in the group survey was vegetables. Vegetables ranked sixth in the individual survey and Junk Food ranked sixth in the group survey. Seventh and eighth in the individual survey were Sweet Snack and Dairy respectively. The order of the final two food groups was the reverse for the group survey; Dairy ranked seventh and Sweet Snack ranked eighth.

The food groups which showed the greatest difference in popularity between the individual and group surveys were junk food and sweet snacks. Junk food was chosen by 60% of participants in the individual survey and only 28% in the group survey. Sweet snacks were also more popular in the individual survey, chosen by 33% of the sample, than in the group survey where it was only chosen by 5% (one group).

Types of Food Selected and Demographics

The relationships between the types of foods selected and the demographic variables collected were examined using Pearson's Correlation Coefficients (Aron et al., 2009) in relation to: individual or group selection, the age of the participant, their gender and the decile rating of the school. These correlations are shown below in Table 3. The demographic information collected for the participants in this study was found to have small to moderate correlations with the types of food included in group survey lunch boxes. In the individual survey, age and decile rating both correlated with the types of foods selected while gender did not.

The amount of fruit included in the lunch boxes produced in the individual survey was found to have a small, positive correlation ($r = .217$, $p < .05$) with the age of the participants. This indicates that more participants in the older age range included fruit items in their lunch boxes.

The age of participants correlated negatively with the inclusion of items from junk food category ($r = -.332$, $p < .01$), indicating that the amount of participants who included items from the junk food category decreased as the age of participants increased.

Table 3

Pearson's correlation coefficients of demographic variables with the proportions of the lunch boxes made up of each type of food

| Food types | Individual | | | Group | | |
|---------------|---------------------|---------------------|--------|---------------------|---------------------|--------------------|
| | Age | Decile | Gender | Age | Decile | Gender |
| Fruit | .217 [*] | .119 | .125 | .086 | .443 ^{**} | -.196 [*] |
| Vegetable | .180 | -.401 ^{**} | .000 | .210 [*] | -.280 ^{**} | .054 |
| Savoury Main | .056 | -.055 | -.146 | -.134 | .119 | -.025 |
| Baked | -.139 | -.104 | .065 | -.132 | -.465 ^{**} | .094 |
| Dairy | -.089 | .030 | .100 | .244 [*] | -.106 | .259 ^{**} |
| Savoury Snack | -.054 | .092 | -.096 | .128 | -.352 ^{**} | .115 |
| Sweet Snack | .060 | -.019 | -.101 | -.279 ^{**} | -.233 [*] | -.186 |
| Junk Food | -.332 ^{**} | .062 | -.012 | -.178 | .403 ^{**} | .019 |

* $p < .05$. ** $p < .01$.

In the group survey, positive correlations were found between age and the proportion of the lunch box made up of dairy products ($r = .244$, $p < .05$) and vegetables ($r = .21$, $p < .05$). These correlations indicate that groups in the older year groups (year 7 and year 8), with older participants, chose to include greater proportions of dairy products and vegetables in their hypothetical lunches than groups in the younger year groups. Age also correlated negatively with sweet snacks ($r = -.279$, $p < .05$) in the group survey, showing a negative relationship between the

age of participants and proportion of the hypothetical lunch box made up of sweet snacks.

The correlation coefficients for the relationship between gender and the types of food chosen in the individual survey indicated that there was no pattern of different amounts of any of the food types chosen by male and female participants. In the group survey female gender was correlated with a higher proportion of dairy food included in the lunch boxes ($r=.259$, $p<.01$), indicating that in the 6 groups which had more female participants a greater proportion of the lunches were made up of dairy products than in the 14 groups with more male participants. Female gender correlated negatively with fruit ($r=-.196$, $p<.05$), showing that the 14 groups with more male participants created lunches with a greater proportion of fruit.

The SES of the school and the number of vegetables selected were negatively correlated ($r=-.401$, $p<.01$) in the individual survey. In the group condition, the decile rating of the schools correlated positively with the proportion of the lunch boxes made up of fruit ($r=.443$, $p<.01$) and junk food ($r=.403$, $p<.01$) and negatively with vegetables ($r=-.280$, $p<.01$), baked foods ($r=-.465$, $p<.01$), savoury snacks ($r=-.352$, $p<.01$) and sweet snacks ($r=-.233$, $p<.05$).

The average number of items included in the individual survey was 9.2 items by male participants and 8.5 items by female participants. The most commonly selected foods by male and female participants in the individual survey are shown in table 4 below. Eight of the ten foods most commonly selected by male participants were also selected by female participants. Cookie and noodles were in the ten most often selected foods by male participants but not by female participants, and mandarin and grapes were commonly selected by female participants but not by male participants.

Table 4

Ten most common foods chosen by male (n=63) and female (n=44) participants for the individual hypothetical lunch choice survey

| Rank | Male | | Female | |
|------|---------------|------------|---------------|------------|
| | Food | Proportion | Food | Proportion |
| 1 | Chippies | 44% | Strawberry | 48% |
| 2 | Sandwiches | 43% | Donut | 45% |
| 3 | Chocolate bar | 41% | Apple | 39% |
| 4 | Apple | 38% | Chippies | 34% |
| 5 | Pizza | 35% | Chocolate bar | 34% |
| 6 | Cookie | 32% | Mandarin | 34% |
| 7 | Donut | 30% | Pineapple | 34% |
| 8 | Strawberry | 30% | Grapes | 30% |
| 9 | Noodles | 29% | Pizza | 30% |
| 10 | Pineapple | 29% | Sandwiches | 30% |

The order of the percent of male and female participants who included food from each of the food groups is displayed in table 5. Fruit and mains were the most commonly selected types of food by both male and female participants in the individual survey. Both types were selected by more than 90% of female participants. Mains were selected by 95% of male participants and fruit by 73%. Savoury snacks were included in the lunches of 71% of the male participants in the individual survey lunches and only 57% of female participants' lunches. Junk food and sweet snacks were included by similar proportions of male and female participants. More female participants included vegetables (52%) and dairy items (34%) than males (vegetables = 35%, dairy = 21%).

Table 5

Food groups in order from most to least selected by male (n=63) and female (n=44) participants in the individual choice survey

| Rank | Male | | Female | |
|------|---------------|---------|---------------|---------|
| | Food group | Percent | Food group | Percent |
| 1 | Main | 95% | Fruit | 93% |
| 2 | Fruit | 73% | Main | 91% |
| 3 | Savoury Snack | 71% | Baking | 68% |
| 4 | Baking | 60% | Junk Food | 64% |
| 5 | Junk Food | 59% | Savoury Snack | 57% |
| 6 | Vegetables | 35% | Vegetables | 52% |
| 7 | Sweet Snack | 33% | Dairy | 34% |
| 8 | Dairy | 21% | Sweet Snack | 32% |

The average number of items included in the individual survey lunch box was 8.1 by participants aged 11 years and older and 9.1 by participants aged 10 years and younger. The ten most commonly selected items by participants aged 7-10 years and 11-13 years in the individual survey are displayed in table 6. Half of the items in the 10 most commonly selected foods were the same for both age ranges. The items which were commonly selected by participants in the younger age range but not the older age range were chippies, cookie, pizza, cake and fruit strings. The items included in the 10 most commonly selected items by participants in the older age range and not the younger age range were pineapple, grapes, wraps, banana and carrots.

Table 6

Twenty most common foods chosen by older (≥ 11 years, $n=46$) and younger (<11 years, $n=60$) participants for the individual hypothetical lunch choice survey

| Rank | Younger (7 - 10) | | Older (11 - 13) | |
|------|------------------|---------|-----------------|---------|
| | Food | Percent | Food | Percent |
| 1 | Chippies | 50% | Apple | 41% |
| 2 | Chocolate Bar | 47% | Donut | 39% |
| 3 | Sandwiches | 38% | Strawberry | 39% |
| 4 | Strawberry | 38% | Sandwiches | 37% |
| 5 | Apple | 37% | Pineapple | 33% |
| 6 | Cookie | 35% | Grapes | 28% |
| 7 | Pizza | 35% | Wraps | 28% |
| 8 | Donut | 33% | Banana | 26% |
| 9 | Cake | 28% | Carrots | 26% |
| 10 | Fruit Strings | 28% | Chocolate Bar | 26% |

Mains and fruit were the most commonly chosen types of food by both the younger and older participants in the individual survey. Dairy and sweet snacks were the least commonly chosen foods across both age ranges. Junk food and savoury snacks were chosen by more young children than older children. Vegetables were more included by more children in the older age range. These results are displayed in table 7.

Table 7

Percentage of older (≥ 11 years, $n=46$) and younger (<11 years, $n=60$) participants who included foods from each food group in the individual survey

| Rank | Younger | | Older | |
|------|---------------|---------|---------------|---------|
| | Food group | Percent | Food group | Percent |
| 1 | Savoury Main | 90% | Savoury Main | 98% |
| 2 | Fruit | 75% | Fruit | 89% |
| 3 | Savoury Snack | 73% | Baked Goods | 57% |
| 4 | Junk Food | 72% | Savoury Snack | 53% |
| 5 | Baked Goods | 67% | Vegetables | 47% |
| 6 | Vegetables | 38% | Junk Food | 43% |
| 7 | Sweet Snack | 32% | Sweet Snack | 34% |
| 8 | Dairy | 30% | Dairy | 26% |

The average number of items chosen by participants from the schools of different decile ratings were 9.1 from the decile 6 school, 6.1 from the decile 7 school and 9.6 from the decile 9 school. Four items were among the 10 most often selected foods across the decile range: apple, chocolate bar, sandwiches and chippies. Donut, strawberry, pineapple and pizza were chosen often among participants from the decile 6 and decile 9 schools but not the decile 7. Foods that were among the 10 most commonly selected at the decile 7 school, but neither of the others, were pie, carrots, cookie, popcorn and noodles. Banana was among the top 10 most selected foods at both the decile 7 and decile 9 schools. Mandarin was the only food that was chosen often by participants at the decile 9 school but not at either of the others.

Table 8

Twenty most common foods chosen by participants from decile 6, 7 and 9 schools for the individual hypothetical lunch choice survey

| Rank | 6 | | 7 | | 9 | |
|------|---------------|------------|---------------|------------|---------------|------------|
| | Food | Proportion | Food | Proportion | Food | Proportion |
| 1 | Donut | 49% | Chippies | 48% | Strawberry | 48% |
| 2 | Apple | 39% | Sandwiches | 43% | Apple | 46% |
| 3 | Chocolate Bar | 39% | Pie | 38% | Chippies | 46% |
| 4 | Sandwiches | 39% | Carrots | 33% | Mandarin | 46% |
| 5 | Strawberry | 39% | Cookie | 29% | Chocolate Bar | 41% |
| 6 | Pineapple | 34% | Popcorn | 29% | Pizza | 35% |
| 7 | Pizza | 34% | Apple | 24% | Donut | 33% |
| 8 | Biscuits | 32% | Banana | 24% | Pineapple | 33% |
| 9 | Chippies | 29% | Chocolate Bar | 24% | Sandwiches | 33% |
| 10 | Grapes | 29% | Noodles | 24% | Banana | 28% |

The most commonly selected food group across all three schools was savoury main, selected by more than 90% of participants, followed by fruit, chosen by 85% of participants at the decile 9 school and 80% of participants at the decile 6 school. Fruit and savoury snacks were both chosen by 77% of participants at the decile 7 school. The third ranked choice by participants at the decile 9 school were savoury snacks and at the decile 6 school were baked goods. The fourth ranked choice at both the decile 6 and decile 9 school was junk food and at the decile 7 school was baked goods. These results are shown below in table 9.

Table 9

Percentage of participants from decile 6, 7 and 9 schools who included foods from each food group in the individual survey

| Rank | Decile 6 | | Decile 7 | | Decile 9 | |
|------|---------------|---------|---------------|---------|---------------|---------|
| | Food group | Percent | Food group | Percent | Food group | Percent |
| 1 | Savoury Main | 95% | Savoury Main | 91% | Savoury Main | 93% |
| 2 | Fruit | 80% | Fruit | 77% | Fruit | 85% |
| 3 | Baked Goods | 78% | Savoury Snack | 77% | Savoury Snack | 70% |
| 4 | Junk Food | 61% | Baked Goods | 50% | Junk Food | 67% |
| 5 | Savoury Snack | 54% | Vegetables | 41% | Baked Goods | 54% |
| 6 | Vegetables | 51% | Junk Food | 41% | Sweet Snack | 37% |
| 7 | Sweet Snack | 41% | Dairy | 32% | Vegetables | 33% |
| 8 | Dairy | 22% | Sweet Snack | 9% | Dairy | 30% |

Reasons for Food Choices

The most commonly selected reasons in the individual condition are summarised in Table 10 below. The most commonly selected reasons in the group condition were we like how it tastes and it is healthy. I like how it tastes was the most commonly selected reason for choices in the individual survey followed by it is healthy. The next three most commonly selected reasons in both the individual and group surveys were it is my (our) favourite, it fills me (us) up and it gives me (us) energy. The order of popularity of these three reasons differed between the conditions; in the individual condition it is my favourite was the third most selected reason followed by it fills me up and it gives me energy and in the group condition it fills us up was followed by it gives me energy and it is my favourite.

Table 10

Reasons selected for the food choices made on the individual and group surveys in order of number of participants selected

| Rank | Individual | | Group | | |
|------|------------------------------|-----|-------|-------------------------------|----------|
| | Reason | N | % | Reason | N % |
| 1 | I like how it tastes | 101 | 93% | We like how it tastes | 104 100% |
| 2 | It is healthy | 96 | 88% | It is healthy | 104 100% |
| 3 | It is my favourite | 85 | 78% | It fills us up | 92 88% |
| 4 | It fills me up | 77 | 71% | It gives us energy | 91 88% |
| 5 | It gives me energy | 71 | 65% | It is our favourite | 84 81% |
| 6 | I eat it every day | 68 | 62% | Our parents like us to eat it | 79 76% |
| 7 | My parents like me to eat it | 63 | 58% | We eat it every day | 78 75% |
| 8 | I am not usually allowed it | 44 | 40% | Our friends eat it | 75 72% |
| 9 | My friends eat it | 39 | 36% | We see other people eating it | 65 63% |
| 10 | I see other people eating it | 38 | 35% | Everyone eats it | 61 59% |
| 11 | Everyone eats it | 37 | 34% | We are usually not allowed it | 52 50% |
| 12 | I like how it looks | 2 | 2% | | |
| 13 | Am allowed to eat it | 1 | 1% | | |
| 14 | It's bacon | 1 | 1% | | |
| 15 | I can eat it all year | 1 | 1% | | |
| 16 | I eat it once a week | 1 | 1% | | |
| 17 | It helps me to get fit | 1 | 1% | | |

The order of the remaining reasons in the individual condition was I eat it every day, my parents like me to eat it, I am usually not allowed it, my friends eat it, I see other people eating it and everyone eats it. In the group condition our parents like us to eat it was followed by we eat it every day, our friends eat it, we see other people eating it, everyone eats it and, finally, we are not usually allowed it. Reasons added by participants in the individual survey were; I am allowed to eat it, it's bacon, I can eat it all year, I eat it once a week and it helps me to get fit.

CHAPTER FIVE: DISCUSSION

Three main research questions guided this study: What food do students select in a simulated lunch choice task and why? What foods do students choose when completing a simulated lunch choice task in groups? Do students' social interactions influence the decision making process in a simulated lunch choice task? In this chapter, the findings from this study are interpreted and discussed in the context of the previous research described in the literature review chapter. Observational and qualitative data provide contextual information about the social interactions that occurred during the group survey. Limitations and strengths of this study are then outlined and the implications of the study's findings for future research and practice are discussed.

Study Results

The results of the analyses conducted for the entire sample of participants will now be discussed, followed by analyses of participants grouped by demographic variables. For both sets of analyses the food choices made in the individual and group surveys were compared. These comparisons were based on the number of participants who selected each food item and the number of participants who included items from the different food groups.

Entire sample analysis

In the overall analysis, the choices made in the individual survey and the group survey followed similar patterns in terms of most popular items and how often foods from each food group were included. Similarities between the individual and group choices included the same fruit and vegetable items being among the 15 most popular items in both the individual and group conditions and the same rank for the four most commonly chosen types of food, which were Savoury Mains, Fruit, Savoury Snacks and Baked Goods, across the two conditions. The

lunch-boxes chosen in the two conditions were structured similarly in that the majority of the lunches included at least one main item, a piece of fruit or a vegetable and either a savoury snack, a baked item, a sweet snack or a junk food item.

The lunch-boxes produced by the participants in this study were structured around staple items, considered essential to a school lunch-box, and additional items, chosen to balance or complete the meal. The largest difference between the two conditions was in the additional items of the meal. This pattern was also identified by (Contento et al., 2006) in their analysis of the structure of lunches chosen by adolescent students in American secondary schools. In the current study, healthier food groups, such as vegetables and dairy, were ranked higher in the group condition than the individual condition. In comparison, food groups made up of more processed items, with lower overall nutritional value and higher fat and sugar content, such as junk food and sweet snacks, ranked higher in the individual condition.

Differences in the reasons selected for the food choices between the individual and group conditions showed a similar pattern. The most commonly selected reasons for both conditions were taste and health. “It is my favourite” was more popular in the individual condition than “it is filling” and “it gives me energy”. These responses were the reverse of the group condition. This finding may indicate that physiological effects of the foods were considered more important during the group decision process than sensory aspects.

All of the groups who were recorded during the group decision making discussed the healthiness of either a single food item or the overall makeup of the lunch. Example of their comments included:

Girl in Year 7 & 8 composite class, “Yeah almonds are really good for you.”

Boy in Year 5 & 6 composite class, “It’s healthy but it’s also

sugary.”

Boy in Year 5 class, “Pie’s actually really fatty.”

Girl in Year 7 & 8 composite class, “We could have something healthy.”

Girl in Year 5 class, “We’re allowed something sweet.”

These interactions demonstrated an understanding of the importance of consuming a range of foods in order to obtain a balanced diet. This is more complex than the understanding demonstrated by the similar aged participants of Atik and Ertekin's (2011) study.

The groups agreed more quickly on whether or not foods were healthy than on whether or not they were liked, or considered tasty, but an area of contention was the importance of choosing healthy foods over tasty ones. This example, from a group of year 5 and 6 students, shows an interaction where two boys disagreed on whether to include a peanut butter and jam sandwich:

Boy 1, “Both of them are pretty unhealthy.

Boy 2, “But they’re delicious.

Boy 1, “No they’re, but they’re really unhealthy”.

When discussing fruit and wraps, the students often agreed quickly, as the majority agreed that they were both healthy and tasty.

The choices made in both the individual and group conditions were similar to the choices made in the healthy-lunch-box condition of the (Dresler-Hawke et al., 2011) study but contrasted with the choices made in the “Dream” lunch condition of their study. This may have been influenced by the presentation of the survey items in the Dresler-Hawke et al. (2011) and this study. The Dresler-Hawke et al. (2011) study used posters depicting photographs of food in

addition to the cartoon images on the survey. In this study, cartoon images from the Dresler-Hawke et al. (2011) survey form were used to represent food items in the individual condition and photographs of food items were used in the group condition. Sensory characteristics of the foods may have been more salient when viewing photographs of food than when viewing the cartoon images.

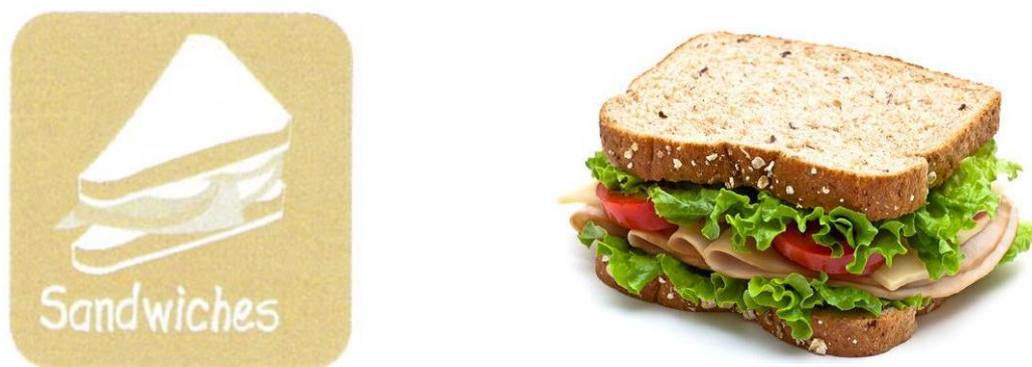


Figure 4. Examples of the images used to present food items in the individual (left) and group (right) surveys. Both types of images were used by Dresler-Hawke et al. (2011).

Demographic variables analysis

Participants' choices were compared across different groups based on three demographic variables: (1) age and (2) gender of participants and (3) decile ratings of the schools, which were used to estimate socio-economic status (SES). The data were analysed based on grouping together students according to these variables and comparing their choices made in the individual and group surveys. The results of these analyses are discussed below.

The results of the analysis of food choices by age

A positive correlation was identified between the age of participants and the proportion of the lunch made up of healthy food items. In the individual survey condition, the older

participants included more fruit in their lunches and less junk food than the younger participants. Similarly, in the group condition, groups with an older average age of participants included more vegetables and dairy products in their lunches than groups made up of younger participants. This trend, of increasing healthfulness of choices with age, concurs with the findings of Ludvigsen and Scott (2009).

The results of the analysis of food choices by SES

A negative correlation was found between SES and inclusion of vegetables in the individual survey lunch box. This finding contrasts with the research findings of Bunting and Freeman (1999 and Utter et al. (2011). Use of a simulated-food-choice task to compare food choices of students of varying SES has not previously been documented in the research literature. The simulated lunch-box-food choice task in this study may have elicited information about the foods children would choose, based on their experiential and cognitive attitudes towards bringing those foods to school in their lunch-box, in a context where the salience of physical barriers (e.g. cost of foods, seasonality, preparation time) was minimised (Glanz, Rimer, & Viswanath, 2008). One participant, a boy in a Year 5 class, argued against the inclusion strawberries in the group lunch-box saying:

“My mum doesn’t like me eating it because it’s so expensive
and I’m not from a rich family. What do you expect? If I could
afford it I’d go and buy packs at a time.”

The group disregarded the comment and chose to include strawberries in the lunch, indicating that the influence of parents was not relevant to their choice of what foods to include in the group’s lunch-box.

In the group choice task, more fruit and junk food items were included in the lunches of participants at higher SES schools. More groups at lower SES schools included vegetables,

baked goods, savoury snacks and sweet snacks in their lunch boxes. This mixed result contrasts with previous research on food choices of adolescents in New Zealand (Utter et al., 2011) and is likely due to differences other than SES between the participating schools. Because the three schools differed widely in their educational philosophy (i.e. mainstream, church affiliated, progressive), the differences between the schools are unlikely to be representative of differences in SES. The three different schools are likely to attract parents with varied values and expectations.

The results of the analysis of food choices by gender

Differences were also found between the choices made by male and female participants in the group survey. More groups with a greater proportion of female participants included dairy products in their lunches and more groups containing a higher proportion of male participants included fruit in their lunches. These findings are consistent with previous research indicating differences between the social norms for food choice for females and males (Atik & Ertekin, 2011; Ludvigsen & Scott, 2009). The direction of the correlation between gender and fruit choice however, contrasts with the findings of previous research with children of this age (Atik & Ertekin, 2011; Caine-Bish & Scheule, 2009; Ludvigsen & Scott, 2009).

Reasons for choices

The reasons provided for the choices made in the individual and group surveys correspond closely with the similarities in food choices across these two conditions. Taste, health, favourite, filling and gives energy were the five most popular reasons for both the individual and group conditions. The similarity in the reasons given for the choices corresponded with the similarity between the foods that were chosen in the two conditions. Taste was the most often chosen reason for both the individual and group surveys. This finding concurs with the findings of previous studies (Ludvigsen & Scott, 2009; Noble, Corney, Eves, Kipps, & Lumbers,

2000).

Health was equally popular with taste in the group condition and ranked second in the individual condition. This finding contrasts with findings of previous research by (Atik & Ertekin, 2011; Cullen et al., 2000; Ludvigsen & Scott, 2009; Noble et al., 2000; Stewart et al., 2006), but corresponds with the structure of the lunches produced by participants in this study, the majority of which included at least one piece of fruit. This finding may be a result of the higher than average SES of the schools included in the study, differences in the communities of the schools involved in the study and the social and historical context surrounding the study population or societal differences in child-food-choice norms or nutrition education in schools between the USA, UK and New Zealand.

Strengths and Limitations

Several strengths and limitations of the study and its implementation will now be discussed. A particular strength of this study was the mixed methods design which had not been documented in this field of research. This design allowed the relationships between the variables to be examined and this had not been possible in previous studies. However, several difficulties were also identified. These are outlined below as are possible areas for future research.

A strength of this study was the mixed methods design, which incorporated quantitative data from the individual survey and group survey to answer the question of what foods students chose in the different choice contexts and qualitative data outlining the reasons why students selected their food choices and how the students interacted with one another during the group decision making to provide details of why their food choices were made. This design has not previously been documented in studies of the food choices of students during middle childhood. The findings that the choices did not differ largely between the two conditions may be useful in

designing future research and interventions for the food choices of students in this population.

A limitation of this study which complicates the comparisons between the individual and group survey data, was the change in the number of items allowed in the individual and group surveys. Because of the reduced number of items allowed to be included in the lunch-box produced in the group condition the participants may have prioritised foods they considered important over those they considered treats, such as those with highly attractive sensory characteristics but low nutritional value (chippies, cookies, chocolate). In the Caine-Bish and Scheule (2009) study, the participants talked about compromises they made when choosing what foods to eat. The same process may have occurred in the group condition of this study where the number of choices was limited, meaning the groups had to compromise to produce a lunch which was both considered acceptable by the majority of the group members and met their own expectations of what to include in a school lunch-box.

The decile ratings of the schools that participated in this study were 6, 7 and 9. As the decile rating scale ranges from 1 to 10, the schools included in this study are not representative of the full range of SES in the population, despite the attempts the researcher made to recruit a range of schools. Some of the results of this study were found to contrast with the findings of (Bunting & Freeman, 1999; Utter et al., 2011), particularly in regard to food choices of students from schools of different decile ratings. The different educational philosophies of the schools included in this study are likely to have contributed to the results found. While these differences are important factors when considering the context of the students' food choices, it would be more useful to study these in the context of a larger study that also includes a sample of mainstream schools across different SES.

Implications

Research

The comparison of individual and group surveys using a within participants design has not previously been reported in this field of research. The majority of studies have used either focus groups or mass individual surveys. By using a combination of these methods this study has taken a step towards determining how different factors influence decision making in individual and group lunch-box-food choices. This design could be applied to specific groups selected for demographic variables or to the study of larger population groups.

The findings of this study also indicate the importance of utilising different data collection methods to gain different information by changing the physical and social context surrounding the decision making and through this, the salience of contextual information, to further differentiate the impact different contextual factors have on the food choices of students at school. The use of the simulated lunch-box food choice survey distanced the participants from the constraints of the availability of particular foods or the environmental, social and economic barriers to accessing particular foods. Further adaptations of the context, such as the space in which the surveys are carried out (e.g. classroom, cafeteria, home) and use of real food choices, could provide additional information about how external factors may influence the food choices made.

The activity used for gathering the data from the students in this study included a survey designed to be attractive for students and easy to complete requiring only minimal reading and the ability to write only one's own name and code numbers. The group activity was also designed to maximise the engagement of the participants. The recruitment of participants for this study was effective with all of the teachers who responded to the initial request for participants continuing with the study. Feedback from the teachers indicated that their decision to participate in the study was influenced by the inclusion of the stop-motion-animation activity.

The stop-motion-animation activity proved to be highly engaging for the students participating in the study. All of the student groups were motivated to participate in the activity and were able to complete the group survey and produce an animation within the limited time allowed. The data collection for the study was at the same time as the release of the Lego Movie. This was highly fortuitous as the students were interested in the medium of stop-motion-animation and excited about being able to produce an animation for themselves.

Practice

An implication for the design of school based nutrition intervention programmes from this study is that participants chose more nutrient rich, low sugar foods such as vegetables and dairy based products in the group condition. This finding highlights the potential utility of peer modelling and mentoring as interventions to increase choice of nutritious foods for inclusion in school lunch-boxes.

The varied effect of the individual and group contexts on the lunch-box food-choices of students of different ages, gender and SES could be taken in to account when planning school based nutrition intervention programmes. Students who are members of different demographic groups may choose different food to eat at school based on salient information gained from their physical and social environment. By varying the salience of information for different individuals, nutrition education and health promotion interventions could target particular groups to increase their influence on the healthfulness of students' lunch-box food-choices.

Conclusion

Increasing rates of childhood obesity is a major health concern across western countries and increasingly spreading to other cultures and developing nations. The complexity of the causes and outcomes of obesity make it necessary for this problem to be examined by

researchers in a range of fields in order to gain insight into the multiple layers of influence causing the obesogenic environment. For children, external forces within this environment largely control what foods are made available to them. Increasingly however, children are gaining influence over their eating behaviour.

This study used a simulated lunch choice task to observe what foods a small group of 109 children in three New Zealand primary schools chose to include in their lunch, and to compare the choices made when the survey was completed individually and when lunches were chosen in small groups. Overall, very little difference was seen between the individual choices and the choices made in groups. The choices made in both groups included more fruit than found in previous research and health was rated as a more important reason for choices than previously found in the research. These findings may reflect an interesting difference in this population in terms of the provision of nutrition education or in terms of the value placed on good nutrition in the region at this time.

This study compared individual and group responses from the same population, included a qualitative element to provide additional context to the quantitative data and utilised an engaging and educational activity as a structure for the collection of the group data. This combination of methods provides a useful tool for additional research into the decision making of primary school students around lunch time food choices.

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APPENDIX A

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12



Lunch-box food choice simulation game Information for Principals

My name is Louise McConnel and I am a student at the University of Canterbury studying towards a Master's of Science in child and family psychology. For my thesis I am conducting a research project about how children select food in the school environment. I am interested in how and why children make decisions about what food they might want in their lunch boxes, both individually and when in a group.

I would like to invite two classes from your school to participate in this study. There are two components to the study. The students are first required to complete an individual survey which involves choosing food from a range of pictures to represent a lunch that they would happily take to school and eat themselves. This can be completed in class any time before the in-class group activity and is expected to take no longer than 10 minutes to complete. The second component is a whole class activity where the students produce a short animated video of a lunch-box being assembled in groups of four to five students. This will require groups to choose what foods they will include in their lunch box and to produce a stop motion film. This activity will take about an hour during class at a time that suits you and the classroom teachers, during either term four 2013 or term one 2014. The study data will be taken from the individual survey responses and the first part of the group activity where students are deciding what to include in the group lunch-box. One of the groups will be randomly selected to be videoed during the deciding phase of the group activity so that their interactions can be analysed at a later time.

Participation in this project is voluntary, with you, the teachers and the students having the right to withdraw at any stage with no penalty. If a student does withdraw, or would not like to be included in the analysis, I will do my best to remove any information relating to them, provided this is practically achievable.

The data from the study will be securely stored on my computer and in a locked cabinet and will be accessed by myself and my two thesis supervisors, Lawrence Walker and Gaye Tyler-Merrick. The students will be required to put their names on the surveys so that individual responses can be matched to the responses of the group they are assigned to but as the information is put into the computer students will be assigned a number and their names will no longer be used in the analysis. The physical copies of the surveys will be securely destroyed once the information has been transferred to the computer. All data, including video recordings, will be stored securely on my computer and will be destroyed after a period of five years. The videos will only be used to transcribe and code the interactions between the students.

Results from this study will be collated and produced as my master's thesis. Further publications or conference presentations may occur. I may be contacted with any further questions, and/or to request a summary of the findings via email at louise.mcconnel@pg.canterbury.ac.nz.

This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Any complaints should be addressed to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you understand and agree to take part in the study please contact me via email at louise.mcconnel@pg.canterbury.ac.nz by (??/??/2013).

Louise McConnel

University of Canterbury Private Bag 4800, Christchurch 8140, New Zealand. www.canterbury.ac.nz

14/08/2013

Lunch-box food choice simulation game

Information for Teachers

My name is Louise McConnel and I am a student at the University of Canterbury studying towards a Master's of Science in child and family psychology. For my thesis I am conducting a research project about how children select food in the school environment. I am interested in how and why children make decisions about what food they might want in their lunch boxes, both individually and when in a group.

I would like to invite your class to participate in this study. There are two components to the study. The students are first required to complete an individual survey which involves choosing food from a range of pictures to represent a lunch that they would happily take to school and eat themselves. This can be completed in class any time before the in-class group activity and is expected to take no longer than 10 minutes to complete. The second component is a whole class activity where the students produce a short animated video of a lunch-box being assembled in groups of four to five students. This will require groups to choose what foods they will include in their lunch box and to produce a stop motion film. This activity will take about an hour during class at a time that suits you, during either term four 2013 or term one 2014. The study data will be taken from the individual survey responses and the first part of the group activity where students are deciding what to include in the group lunch-box. One of the groups will be randomly selected to be videoed during the deciding phase of the group activity so that their interactions can be analysed at a later time.

Participation in this project is voluntary with you and the students having the right to withdraw at any stage with no penalty. If a student does withdraw, or would not like to be included in the analysis, I will do my best to remove any information relating to them, provided this is practically achievable.

The data from the study will be stored on my computer and in a locked cabinet and will be accessed by myself and my two thesis supervisors, Lawrence Walker and Gaye Tyler-Merrick. The students will be required to put their names on the surveys so that individual responses can be matched to the responses of the group they are assigned to but as the information is put into the computer students will be assigned a number and their names will no longer be used in the analysis. The physical copies of the surveys will be destroyed once the information has been transferred to the computer. All data, including video recordings, will be stored securely on my computer and will be destroyed after a period of five years. The videos will only be used to transcribe and code the interactions between the students.

Results from this study will be collated and produced as my master's thesis. Further publications or conference presentations may occur. I may be contacted with any further questions, and/or to request a summary of the findings via email at louise.mcconnel@pg.canterbury.ac.nz.

This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Any complaints should be addressed to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

If you understand and agree for your class to take part in the study please complete the consent form and return it to me via email at louise.mcconnel@pg.canterbury.ac.nz by (??/??/2013).

Louise McConnel

University of Canterbury Private Bag 4800, Christchurch 8140, New Zealand. www.canterbury.ac.nz

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14/08/2013



Lunch-box food choice simulation game Information for Parents

My name is Louise McConnel and I am a student at the University of Canterbury studying towards a Master's of Science in child and family psychology. For my thesis I am conducting a research project about how children select food in the school environment. I am interested how and why children make decisions about what food they might want in their lunch boxes, both individually and when in a group.

I would like to invite your child to participate in this study. There are two components to the study. All of the students in the class will first be required to complete a survey individually which involves choosing foods from a provided range to represent a lunch that they would happily take to school and eat themselves. This will take no more than 10 minutes. The second component is an in class activity where all the students produce a short animated film of a lunch-box being assembled in groups of 4-5. This will require students to choose what foods they will include in their groups lunch box and to produce a stop motion film. An hour of class time will be allowed for this activity. The study data will be taken from the individual survey responses and the first part of the group activity where students are deciding what to include in the group lunch-box. One of the groups will be randomly selected to be videoed during the deciding phase of the group activity so that their interactions can be analysed later. Both of the components of the study will be completed during school time. Your child may be one of the students selected.

Participation in this project is voluntary and the students have the right to withdraw at any stage with no penalty. If a student does withdraw, or would not like to be included in the analysis, I will do my best to remove any information relating to them, provided this is practically achievable.

The data from the study will be stored on my computer and in a locked cabinet and will be accessed by myself and my two thesis supervisors, Lawrence Walker and Gaye Tyler-Merrick. The students will be required to put their names on the surveys so that individual responses can be matched to the responses of the group they are assigned to but as the information is put into the computer students will be assigned a number and their names will no longer be used in the analysis. The physical copies of the surveys will be securely destroyed once the information has been transferred onto the computer. All data, including video recordings, will be stored securely on my computer and will be destroyed after a period of five years. The videos will only be used to transcribe and code the interactions between students.

Results from this study will be collated and produced as my master's thesis; this will be publicly available through the UC Library. Further publications or conference presentations may occur.

I can be contacted if you have any further questions, and/or if you wish to request a summary of the findings please email me at louise.mcconnel@pg.canterbury.ac.nz.

This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Any complaints should be addressed to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Please complete the consent form for your child to take part in the study. Please return the completed consent form to your child's classroom teacher by (??/??/2013).

Thank you for taking the time to consider this information.

Louise McConnel

University of Canterbury Private Bag 4800, Christchurch 8140, New Zealand. www.canterbury.ac.nz

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14/08/2013



Lunch-box food choice simulation game Information for Children

I am Louise McConnel and I am a student at the University of Canterbury. As part of my university study I am going to do a lunch-box food choice activity in your classroom.

I am asking you to take part in a classroom activity. It will have two parts.

First I will give you some pictures of food and ask you to choose what you would like in your lunch box. This should take no more than 10 minutes.

Secondly, you will work in a small group of 4-6 peers to choose some food to include in a lunch box that your group will use to make a short video. This will be done in an hour or class time.

I will video one group choosing what food to include and use this recording later to remember what was said between everyone in the group. I am interested to see what foods you select and how this decision was made within the group.

You do not have to join in the activity and you can pull out at any time, even once it has started. If you choose to join in but you do not want to be included in the study, the information from your survey will not be included and any information relating to you will not be included from the group activity, as long as this is practically achievable.

The information from the study will be stored on my computer and only my supervisors, Lawrence Walker and Gaye Tyler-Merrick, and I will have access to it. You will need to put your name on the survey and later on I will replace it with a code name, this is so that the information you give will not be easily recognised as yours. The video will only be used to record what the people in the group said to each other.

The surveys will be destroyed once the information has been put on the computer. The information on the computer will use your code name. All of the data, including the videos will be deleted after five years.

Your parents can request a summary of the findings when the project is finished and if you would like to know what the results were, please talk to them.

This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee. Any complaints should be addressed to The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Please complete the consent form if you understand and agree to take part in my study.

Louise McConnel

University of Canterbury Private Bag 4800, Christchurch 8140, New Zealand. www.canterbury.ac.nz

Lunch-box Choice Simulation Activity
Consent Form for Principals

A full explanation of this project has been provided and I have been given the opportunity to ask questions.

I understand what is required of me, my teachers and the students.

I understand that participation is voluntary and I can withdraw from the project at any time without penalty.

I understand that any information or opinions provided by me, the teachers or the children in my school will be kept confidential to Louise McConnel (the researcher) and her supervisors, Lawrence Walker and Gaye Tyler-Merrick, and any published or reported results will not identify them or the school.

I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after five years.

I understand that a report of the findings is available by post or email from the researcher.

I understand that I can contact the researcher for further information via telephone or email.

I understand that if I have any complaints I can contact The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Full Name _____

Signature _____

Date _____

Louise McConnel

College of Education

ury.ac.nz

Lunch-box Choice Simulation Activity Consent Form for Teachers



A full explanation of this project has been provided and I have been given the opportunity to ask questions.

I understand what is required of me.

I understand that participation is voluntary and I can withdraw my class at any time without penalty.

I understand that any information or opinions provided by myself or the children in my class will be kept confidential to Louise McConnel (the researcher) and her supervisors, Lawrence Walker and Gaye Tyler-Merrick, and any published or reported results will not identify them or the school.

I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after five years.

I understand that a report of the findings is available by post or email.

I understand that I can contact the researcher for further information via telephone or email.

I understand that if I have any complaints I can contact The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Full Name _____

Signature _____

Date _____

Louise McConnel

College of Education

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Lunch-box Choice Simulation Activity Consent Form for Parents

A full explanation of this project has been provided and I have been given the opportunity to ask questions.

I understand what is required of me.

I understand that participation is voluntary and I can withdraw my child at any time without penalty.

I understand that any information or opinions provided by my child will be kept confidential to Louise McConnel (the researcher) and her supervisors, Lawrence Walker and Gaye Tyler-Merrick, and any published or reported results will not identify them or their school. My thesis will be publicly available through the UC Library.

I understand that all data collected for the study will be kept in locked and secure facilities and in password protected electronic form and will be destroyed after five years.

I understand that a report of the findings is available by post or email. *Please leave an address for this to be sent to at the bottom of this form.*

I understand that I can contact the researcher for further information via telephone or email or can contact her through the classroom teacher.

I understand that if I have any complaints I can contact The Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz).

Full Name _____

Signature _____

Date _____

Email or postal address to receive a report of the findings _____

Please return this consent form to your child's class teacher by (Date to be confirmed).

Louise McConnel

College of Education

Ph. 0211532562

Email: louise.mcconnel@pg.canterbury.ac.nz



Lunch-box Choice Simulation Activity

Consent Form for Students

Please tick each box

- ☐ I have read the information sheet and understand what is asked of me.
- ☐ I understand that I may be in the group that will be videotaped.
- ☐ I understand that my information will only be accessed by Louise and her supervisors.
- ☐ I understand that neither I, nor my school, will be identified in any presentations or publications that draw on this research project.
- ☐ I understand that I do not have to join in and that if I do choose to I can pull out at any time.
- ☐ I understand that my parents can request, if they wish, a summary of the final report and I can talk to them about it.
- ☐ I understand that I can get more information about this study by asking my teacher, my parents/caregiver or Louise's two supervisors.
- ☐ I understand I can contact the University of Canterbury Education Research Human Ethics committee if I have any complaints about the study.
- ☐ I agree to join in this study and my parents have also given consent on their consent form.

Full Name _____

Signature _____

Date _____

Please return this consent form to your class teacher.

APPENDIX B



HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen
Email: human-ethics@canterbury.ac.nz

Ref: 2013/54/ERHEC

2 October 2013

Louise McConnell
School of Health Sciences
UNIVERSITY OF CANTERBURY

Dear Louise

Thank you for providing the revised documents in support of your application to the Educational Research Human Ethics Committee. I am very pleased to inform you that your research proposal "How does social interaction affect children's school lunch box food choices in a simulation game?" has been granted ethical approval.

Please note that this approval is subject to the incorporation of the amendments you have provided in your email of 23 September 2013.

Should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please let me know.

We wish you well for your research.

Yours sincerely

A handwritten signature in black ink, appearing to read 'N Surtees'.

Nicola Surtees
Chair
Educational Research Human Ethics Committee

"Please note that Ethical Approval and/or Clearance relates only to the ethical elements of the relationship between the researcher, research participants and other stakeholders. The granting of approval or clearance by the Ethical Clearance Committee should not be interpreted as comment on the methodology, legality, value or any other matters relating to this research."

E S

APPENDIX C

Name _____

Lunch Box Choices

Instructions

Choose what you would like in your lunch box to bring to school

Write a number over each food item that you choose in the order that you chose them

For example:



If there is something you would like that is not there write or draw it in one of the extra squares

Once you are finished turn over to the other side



Why did you choose this food?

For each item of food you chose, choose a reason why you picked it

Write the same number on the reason as you wrote on the picture on the first page

For example:

Celery was the second food I chose



I chose it because my friends eat it



If one reason applies to more than one food item write the numbers for all the relevant items on that box

If there is another reason for why you chose something write it in one of the extra boxes

| | | |
|--------------------|------------------------------|------------------------------|
| I eat it every day | I like how it tastes | My parents like me to eat it |
| My friends eat it | I see other people eating it | It is healthy |
| It gives me energy | It is my favourite | It fills me up |
| Everyone eats it | I am usually not allowed it | |

APPENDIX D

Group activity instructions

We're going to make a stop motion movie of a lunch box being put together. A stop-motion movie is made by taking photos and joining them together. In each photo the picture moves a little bit. You will have 45 minutes to complete the recording form and make a stop motion movie.

When I call your name come and collect a piece of equipment for your group. Each person will have a job and a piece of equipment that they are responsible for.

Photographer: iPad.

Recorder: Recording form, pencil.

Director: Food pictures.

Organiser: Lunch-box picture and blutack.

Timer: Coloured pencils.

Each group should have:

An iPad and stand.

A recording form and pencil.

Food pictures.

Lunch box picture blutacked to the desk.

Coloured pencils.

Each person should have a coloured pencil. Write your names in the box at the top of the recording form using your coloured pencil.

First your group will choose what food to include in your group lunch box.

The **organiser** will count how many people agree with the choice and how many people would not include that in their lunch box.

The **recorder** will write down what food the group chose and how many agreed and disagreed with the choice on the recording form. The number will look like this agree/disagree.

Then you will choose a reason for the choice. The **recorder** will tick next to the reason the group chooses.

Each person in the group will use their coloured pencil to tick that they know what food has been picked by the group and what reason was chosen.

The **photographer** and **director** will set up the iPad on the desk so that the lunch box picture fits on the screen. Use the blutack to stick the paper down so it won't move. The **director** puts the picture of the food the group chose on the desk and the **photographer** takes a picture. The **director** moves the picture towards the lunch box in little steps and each time the **photographer** take a picture.

Do this again for the rest of the food you want in the lunch box. Choose up to six different foods.

The **timer** will keep an eye on the time and make sure that the group is on track. They will encourage the group to work faster if they are getting behind.

When the movie is finished the **timer** will come and tell me.